



NASA Open Government Plan

Open Government Initiative

TRANSPARENCY • PARTICIPATION • COLLABORATION

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Executive Summary

Whether NASA is using social networks to allow students to interact directly with astronauts or creating a Cloud Computing Platform to give unprecedented access to scientific data, NASA has embraced Open Government. Our founding legislation in 1958 instructed NASA to "...provide for the widest practicable and appropriate dissemination of information..." The principles of Open Government have been embedded in NASA operations for 50 plus years. This plan is our start in revisiting these concepts and creating a new level of openness and accountability in our policies, technology, and overall culture. The plan will evolve over time as we continue to see success in these areas and work to replicate it throughout the Agency.

The NASA Open Government Plan is divided into two main sections: the "Framework and Leadership" section and 25 fact sheets. The "Framework and Leadership" section describes NASA's history of openness and outlines our framework for approaching Open Government. This framework is based on: a perspective of continuous learning; integration of policy, technology, and culture; and the rapidly changing external environment. We believe that integrating Open Government Principles into existing systems (e.g., governance councils and performance management system) provides the best framework for success. Through this plan we establish a solid foundation for institutional change based on the five NASA Open Government principles:

1. Increase Agency transparency and accountability to external stakeholders.
2. Enable citizen participation in NASA's mission.
3. Improve internal NASA collaboration and innovation.
4. Encourage partnerships that can create economic opportunity.
5. Institutionalize Open Government philosophies and practices at NASA.

The 25 fact sheets in this plan highlight specific activities at NASA that meet and, in many cases, exceed the requirements Open Government Directive. Three "Flagship" initiatives describe NASA's most recent efforts and commitment that take Open Government to a new level. Each "Flagship" initiative focuses on one of the interconnected tenets of Open Government:

- **Policy:** NASA is working to make open source software development more collaborative at NASA to benefit both the Agency and the public.
- **Technology:** NASA Nebula, the U.S. government's only cloud computing platform, offers an easier way for NASA scientists and researchers to share large, complex data sets with external partners and the public.
- **Culture:** The creation of a new NASA Participatory Exploration Office will infuse more public participation into NASA's mission.

In addition to the "Flagship" fact sheets, this plan highlights four other new initiatives that demonstrate how NASA is more open and participatory, such as NASA's contributions to Data.gov and Open Innovation Pilots. More than half of fact sheets outline ongoing

initiatives at NASA that have been in place for some time and our efforts to make them even more open and collaborative. Some fact sheets describe ongoing activities unique to NASA that showcase our history of giving the public open access to our missions such as NASA TV and opportunities for public participation and collaboration such as Education Activities and Centennial Challenges, NASA's prize program. Other fact sheets describe areas that apply to all Agencies, such as FOIA, Congressional outreach, declassification, and records management. All of the initiatives, both new and ongoing, described in this plan outline how these areas will make improvements in the Open Government principles in the short and long term.

The fact sheets all follow the same structure to enable easier browsing and comprehension. Each one is written by the respective initiative, project, or program giving them the opportunity to communicate what they do, how it fits into Open Government, their goals for the next two years, useful links, and two anecdotes that embody Open Government. The Web site www.nasa.gov/open/plan has the entire plan online, where each fact sheet is its own Web page.

The Open Government Directive calls on NASA to do what it does best—innovate. In our history, we have achieved seemingly impossible goals, from reaching the Moon to advancing fundamental knowledge about our place in the universe. In the past we would create the technologies to achieve these goals through internal teams and collaborations. NASA must now innovate how we innovate, focusing on technologies that advance humanity into space while more directly involving citizens and public-private partnerships. The Open Government Directive also calls on us to change the way we do business, and as a result turn us into a twenty-first-century space program for a twenty-first-century democracy.

Letter from the CIO and CFO: Open Government at NASA

April 7, 2010

Dear Friends and Family of NASA,

In December 2009, the White House issued the Open Government Directive calling on Executive Branch agencies to become more open, accountable, and centered on the principles of transparency, collaboration, and participation. **NASA has embraced this Open Government challenge.**

This is the first version of NASA's plan to embed the Open Government framework into all levels of our organization. This plan is the result of hard work by NASA's Open Government Working Group, and collaboration with other agencies to share best practices and approaches. This plan will continue to grow and evolve as we experiment with new ways of doing business and partnering with the public. We already had a successful engagement while drafting this plan, receiving 420 ideas from 280 different authors through the Citizen Engagement Tool provided by GSA. More than 1,200 people cast almost 5,000 votes for the ideas and made 700 comments. Future versions of this plan will highlight successes from our current efforts and seek ways to replicate them across our centers and missions. We will also identify what is not working and strive for improvement. The adoption of new technology, protocols, procedures, and policy is no easy task. Nonetheless, the Open Government Initiative is an opportunity to strengthen NASA, and in turn, strengthen democracy.

Please join us. Continue to participate. Right now you can read through and share the 25 fact sheets highlighted in this plan at www.nasa.gov/open/plan. You can be a direct contributor to building the strategy for expanding human presence into the solar system. Since the first human entered space in 1961, there have been just over 500 people who have orbited the Earth or traveled to the Moon. These missions were carried out by select teams. But one thing is true about our upcoming missions to space: this time, we can all take part.



Linda Y. Cureton
NASA Chief Information Officer



Elizabeth (Beth) Robinson
NASA Chief Financial Officer

Framework and Leadership

Openness Overview: Part of NASA's DNA

NASA's founding legislation, the National Aeronautics and Space Act of 1958, addresses the role NASA should play in ensuring the general welfare of the United States, with language directly applicable to the principles of Open Government:

Sec. 203. (a) The Administration, in order to carry out the purpose of this Act, shall—

- (1) plan, direct, and conduct aeronautical and space activities;
- (2) arrange for **participation** by the scientific community in **planning** scientific measurements and observations to be made through use of aeronautical and space vehicles, and conduct or arrange for the conduct of such measurements and observations;
- (3) provide for the widest practicable and appropriate **dissemination of information** concerning its **activities** and the **results** thereof;
- (4) seek and encourage, to the maximum extent possible, the **fullest commercial use of space**; and
- (5) encourage and provide for Federal Government **use of commercially provided space services** and hardware, consistent with the requirements of the Federal Government.

— NASA Space Act (as Amended), Section 203 [emphasis added]

As the Space Act articulates, there is a strong linkage between transparency, dissemination of information, and the commercial uses of space (or economic development). For more than a half-century, we have created policies and processes to carry out our legislated mission. Examples include:

- The availability of raw science data archived by all NASA missions, for open use.
- Inclusion of the scientific community in road mapping and strategic planning, mainly through the National Academies of Science and other working groups.
- Use of full and open competition, including NASA centers, academia, and industry, to implement projects that help fulfill mission requirements.

Examples are given in more detail in the sections about specific initiatives.

Openness is fostered from the organizational level to the level of individual employees. Our employees have incentives and sometimes even requirements to be open and collaborative. NASA's civil service performance management system specifically measures employees' collaboration and teamwork. Tracking employees' performance in this regard demonstrates our commitment to innovation, accountability, and collaboration at all levels throughout the Agency. Our leadership development training promotes a culture of openness and collaboration as well. Each leadership level requires competencies in communication and

advocacy, knowledge management, and customer, stakeholder, and partner relationships. For NASA's science community, publishing research is often required for career advancement within the Agency.

Finally, we continue to employ many approaches to operations that already embody transparency, participation, and collaboration, such as:

- Strategic planning with external stakeholders.
- Employing collaboration tools to improve communication with our scientific and technological communities.
- Seeking partnerships for mission success.

Framework for Open Government

NASA is a community of scientists, engineers, and other professionals who explore the Earth and space for the benefit of humankind. As we uncover increasing knowledge about the universe and solve difficult engineering challenges, we are continuously experimenting in labs, workshops, and offices. We gather and analyze information about our universe, requiring perseverance and creativity to solve unique challenges. Unlocking the complex systems of the cosmos does not come with an operating manual. Instead, we create hypotheses, conduct experiments, and refine our mental models and conceptual frameworks based on evidence and experience.

Open Government presents similar challenges as we work to improve our performance and responsiveness to the Open Government Directive, thus the NASA Open Government Plan is not a manual. By recognizing current initiatives that exemplify the values of Open Government, this plan can be used as a model for change throughout the Agency. Applauding these successes creates a social incentive for our workforce to innovate, to keep looking for ways to be more efficient, to further enhance our relationships existing stakeholders, and to create new partnerships. The guidance contained in the Open Government Directive creates cultural and procedural opportunities for new initiatives, such as those contained in the subsequent fact sheets. We believe that this is a continuous learning process, and thus have chosen to couch our Open Government efforts as a framework in which to experiment and learn over time.

The Open Government framework strives to be multi-dimensional in its approach, addressing technology, policy, and culture. When all three of these tenets are targeted for improvement, greater possibilities present themselves and momentum builds. While some of the initiatives outlined in the subsequent fact sheets focus on one of these areas more than the others, most strive to touch on all three.

The Open Government Initiative is a movement within government to adapt to the changing external environment, embrace new technologies, engage with our citizens, and encourage collaborations and partnerships. This is the result of the government recognizing that we can be more relevant for our stakeholders and intentionally create a culture of openness as we evolve into a twenty-first century democracy. For NASA, we are in the midst

of a massive change ourselves. The external environment of the aeronautics and space sector is undergoing a shift in how business is conducted, which results in changing roles of the major players. Today, there is no “space race.” Instead we recognize that new innovations have occurred, new countries have aspirations for the cosmos, and new entrepreneurs have plans to change the world. Announced in the FY11 budget, NASA is embarking on a bold, new strategy for extending humanity into the solar system. The core of the strategy recognizes American ingenuity as a rich resource to develop more capable and innovative technologies and to create a thriving commercial space sector.

At the publishing of the first version of this Plan, the NASA budget has been known for two months. Needless to say, we’ve been busy responding to the requests, forming study teams, and charting a strategy to execute on our new direction. The Open Government Initiative is extremely timely for us, as it provides a perspective to ensure that we are open in our processes, we generate data products of utility for the space sector, and we enter into partnerships across the US government, with industry, other nations, and the public.

Implementation of the Plan

Achieving a more Open Government will require the various professional disciplines within the Government—such as policy, legal, procurement, finance, and technology operations—to work together to define and to develop Open Government solutions.

When the Open Government Initiative was announced, NASA acted swiftly. In March 2009 we established the Data.gov Working Group, comprised of many data experts throughout NASA. Through the efforts of recovery.gov and USAspending.gov many financial and procurement professionals gathered to meet their presidential directives. With the issuance of the Open Government Directive NASA identified two accountable officials: the NASA CFO as the senior accountable official (SAO) for financial data quality and the CIO as the accountable official for Open Government at NASA. A short-term Open Government Working Group was established at NASA Headquarters. Upon the release of version 1.0 of the NASA Open Government Plan, this working group will evolve into the Standing Open Government Working Group.

Standing Open Government Working Group

The two accountable officials for Open Government at NASA sit as members of the NASA governance councils that set Agency priorities, share information, and make decisions. They will oversee the Working Group, and update NASA leadership as appropriate, on the opportunities and challenges to be more transparent, participatory and collaborative. The Working Group will meet on a regular basis and will be responsible for seeking and prioritizing program opportunities, process improvements, and other initiatives. To ensure integration, the Working Group will be co-chaired by a member of the Data.gov working group via the CIO’s office and the Data Quality working group via the CFO’s office.

“NASA controls all strategic management processes through its governance structure, which consists of three Agency-level management councils.”

—Chapter 3.1, Governance and Strategic Management Handbook, NPD 1000.0A

Policy and Strategic Planning

In 2010, our three key governance documents will be rewritten and updated:

- The NASA Governance and Strategic Management Handbook (NASA Policy Directive – NPD – 1000.0A).
- The NASA Organization (NPD 1000.3D).
- The NASA Strategic Plan (NPD 1001.0).

These NASA policy directives provide the framework for Agency performance, including the expected goals, strategies, and means for achieving them (all NASA Policy Directives are online at the NASA Online Directives Information Service: nodis3.gsfc.nasa.gov). Open Government Working Group members will be involved in drafting and reviewing the new policy documents to incorporate Open Government principles that will lead to a more open, collaborative, and participatory Agency.

Cross-cutting Objectives and Performance Goals

NASA has developed the following five principles to guide its efforts to integrate Open Government into the Agency:

1. Increase Agency transparency and accountability to external stakeholders.
2. Enable citizen participation in NASA's mission.
3. Improve internal NASA collaboration and innovation.
4. Encourage partnerships that can create economic opportunity.
5. Institutionalize Open Government philosophies and practices at NASA.

These are directly aligned with the plan components articulated in the Open Government Directive. Using these principles we have developed a set of cross-cutting objectives and performance goals (Table 1 below), that will be incorporated into NASA's performance management system. They will appear in NASA's Annual Performance Plan for the upcoming fiscal year, with a required progress report, the Performance and Accountability Report, or PAR, at the end of the fiscal year. We believe that integrating Open Government principles into existing systems provides the best framework for success, as evidenced by the links we are establishing to our governance councils and performance management system. As such, the accountability for the Open Government objectives and performance goals will be through the PAR, and there will not be an approach to report on the specific Open Government initiatives within the fact sheets as their progress are considered indicators for the performance goals.

As stated earlier, there is no prescribed way to be an Open Government agency. We believe it is the responsibility of each office, program, and employee to make this vision become a reality. By distributing the majority of the plan into separate fact sheets and allows each office and program to set their own performance initiatives in the "NASA's Mission Directorates and Open Government" section, we're providing an opportunity to lean forward, experiment, modify, and succeed. Via the GSA-provided Citizen Engagement Tool, we moderated an open dialogue with the public and NASA employees to gather ideas to incorporate in the NASA Open Government Plan. A summary of the online consultation is

the appendix of this Plan. By taking a continuous learning approach, what we set out to do today, may not be what we implement in the future. As such, the Open Government initiatives highlighted in the fact sheet are just that: a continuous learning approach.

Table 1: Cross-cutting Objectives and Performance Goals

Objectives	Performance Goals (over a 3 to 5 year timeframe)
Enhance processes to release high-value data to the public as standard procedure for programs and projects that generate data.	Develop a strategy and issue guidance to improve the process of proposing and submitting NASA data to Data.gov.
	Issue guidance on data product architecture early in the development of a project that explicitly addresses public data products.
Improve access to and timeliness of NASA accountability and mission-related data.	Publishing of 10 new high value data sets to Data.gov in 2010.
	Develop an integrated FOIA reading room.
	Improve common data definitions, data standards, and data release processes, demonstrating a maturing data architecture for NASA systems, such as financial, procurement, safety.
Improve collecting, addressing, and responding to public input about NASA's policies and programs.	Release of online ideation and brainstorming tools as a Software as a Service (SaaS) to NASA projects.
	Define the degrees of involvement anticipated, e.g., a scale of 1 through 5, for participatory exploration and seek program opportunities to fit this scale.
Generate enhancements in NASA management, communication, and governance by engaging in internal collaboration activities.	Mature and expand usage of NASA-wide collaboration tools for knowledge management.
	Expand the development and use of employee networking tools that encourage Communities of Interest and skill identification.
	Use employee collaboration activities to identify process improvement opportunities and develop action plans to prioritize and complete the identified processes.
Increase collaboration and partnerships with other Federal agencies, the private sector, and other non-governmental organizations.	Increase the number of distinct users of NASA Earth Science data and services.
	Use innovative methods (prizes, competitions, etc) to spur infusion of technologies targeted to NASA mission needs.
	Develop and implement strategies and mechanisms to provide feedback to the public regarding the results of collaborations and idea submissions, including explanation of related actions.

Incorporate Open Government principles in developing new and updating existing policies.	Incorporate Open Government principles into Center policies or directives as they are developed or updated.
	Incorporate Open Government principles into NASA Policy Directives as they are developed or updated.

Conclusion

Open Government principles are already evident in many activities underway throughout NASA. Through the Open Government Initiative, we have begun the dialogue across the Agency on how to infuse Open Government principles into more of our daily operations. These conversations allowed us to see new opportunities to strive for greater transparency, participation, and collaboration as our strategic directions focus on the opportunities for the twenty-first century.

The underlying motivation behind the Open Government Initiative marks a shift in the way we interact with the public and conduct information resource management. As such, we will face inevitable challenges as we transition from current-state operations to the Agency-wide adoption of policies and tools designed to increase transparency and enhance collaboration both internally and externally. We recognize the need to understand and plan for such challenges in order to sustain Open Government practices throughout NASA.

Our approach has been to find the projects and anecdotal successes that embody values of openness, participation, and collaboration so that we can celebrate and build upon them. NASA's flagship projects demonstrate our adoption of, and commitment to Open Government principles. NASA has set up a standing Open Government Working Group to assist leadership in policy reviews, representing the strategic benefits of openness within the Agency, developing a roadmap for integration into all elements of NASA's activities, and implementing specific initiatives.

No one is an expert in Open Government. We are taking an experimental and scientific approach to Open Government. We recognize the long-term nature of this movement. Finally, we believe that the three flagship projects we have chosen are catalysts for change. They will transform NASA into a more transparent, participatory, and collaborative Agency and ease our transition into a twenty-first-century space program.

NASA's Missions Directorates and Open Government

NASA's four mission directorates—Space Operations, Aeronautics Research, Science, and Exploration—work to advance global understanding of the systems and processes on our planet, in our atmosphere, and in the cosmos. The core tenet of NASA's existence is to spread our accumulated information for the benefit of humankind. As we work towards making our processes even more open, we are striving to create even more opportunities for public participation and collaboration. This section will give you a basic understanding of the goals and objectives of each mission directorate as well as a glimpse into how they have formulated their Open Government activities.



Size of words represents frequency of word use in this section.

Visualization by www.wordle.net.

Space Operations Mission Directorate and Open Government*Missions to the International Space Station and Beyond*www.nasa.gov/topics/shuttle_station/

☒ Transparency ☒ Participation ☒ Collaboration

The NASA Space Operations Mission Directorate includes the work of the International Space Station (ISS), the Space Shuttle Program, the Launch Services Program, and the Space Communications and Navigation (SCaN) Program. These programs comprise NASA's human spaceflight activities on orbit as well as the launch and communication services for all NASA human and robotic spacecraft. To achieve our mission, we must partner with other organizations, both internationally and domestic. We strive to make all activities as open and participatory as possible so that everyone on planet Earth may be a part of these missions of discovery and exploration.

Overview

NASA's principle of openness has been an integral part of human spaceflight operations by design, with all of NASA's most challenging missions undertaken live in front of a global audience. From the Apollo Program's unprecedented television coverage in the 1960s (which won NASA Television a 2009 Emmy for Lifetime achievement) to today's live video calls between school children and the ISS, human spaceflight has lead the way as an example for transparency within NASA.

View ISS Assembly Spacewalks Livewww.nasa.gov/ntv*Spacewalk on November 3, 2007*

NASA broadcasts spacewalks live over NASA TV and the Internet, even the most challenging of ISS assembly tasks. While anchored to a foot restraint on the end of the Orbiter Boom Sensor System (OBSS), astronaut Scott Parazynski, STS-120 mission specialist, participated in the mission's fourth session of extravehicular activity (EVA) while Space Shuttle Discovery was docked with the International Space Station. During the 7-hour, 19-minute spacewalk, Parazynski cut a snagged wire and installed homemade stabilizers designed to strengthen the damaged solar array's structure and stability in the vicinity of the damage. Once the repair was complete, flight controllers on the ground successfully completed the deployment of the array.

NASA and its international partners are working to complete assembly of the ISS, and post-completion, the Space Shuttle will be retired. The first element of the ISS was launched in 1998 and since then every step of on-orbit assembly of this laboratory has been open for the public to see. This unprecedented international achievement—with numerous, challenging spacewalks, delicate robotic arm operations, and visiting vehicles from around the world—has all been broadcast live on NASA TV. Every Shuttle launch, landing, and on-orbit operation has been available through television and the Web to engage the public in our country's civil space program. With assembly nearly complete, full use of ISS as a national laboratory is beginning. NASA plans to continue its transparency in sharing the compelling work of our astronauts on-orbit into the future.

ISS is a collaboration of five space agencies:—NASA, The European Space Agency, the Japanese Exploration Agency, the Canadian Space Agency, and Russian Space Agency. The U.S. segment of the ISS has been named as the nation's newest National Laboratory. Use of the ISS as a National Laboratory involves partnerships with several Government Agencies and organizations, including the National Institutes of Health, the National Science Foundation, the US Department of Agriculture, US Department of Defense, US Department of Energy, and a number of private companies and consortia including Astrogenetix, Inc., BioServe Space Technologies, Ad Astra Rocket Company, NanoRacks, LLC, and Zero Gravity, Inc.

NASA provides live video feeds of all major human spaceflight operations, such as launch, landing, docking, undocking, all space walks, major on-orbit assembly operations, and extensive coverage of daily life on-board the ISS. In addition to mission reporting available on NASA TV, the public can track the ongoing operations of the ISS through a variety of Web sites. The NASA ISS Web site provides a significant amount of information on the ISS, including an interactive ISS reference guide, photographs, daily crew timelines, and ISS news, as well as links to live ISS video and mission audio. Also, an ISS daily report is published 365 days per year, detailing the day's activities as well as any problems encountered or issues being worked.

View a Rocket Launch with your own eyes
kennedyspacecenter.com/



Liftoff of STS-129 on November 16, 2009

The Space Shuttle launches from Kennedy Space Center in Florida, just as the Apollo missions to the Moon and other historical launches have in the past. Expendable launch vehicles launch from Cape Canaveral Air Force Station next door. These launches can be viewed (and felt) up and down the coast, from miles away. Visitors to Florida can visit the Kennedy Space Center visitor's center, take a tour of the space center itself, ride the Shuttle Launch Experience, and visit local space-related attractions. The launch can be viewed from inside the space center (with tickets) or from the beaches and local establishments in the neighboring communities. For many, viewing a launch is an once-in-a-lifetime opportunity to connect with missions to outer space.

NASA is working to expand the range of activities in which people can participate. In 2006, NASA conducted a student competition to name the Node 2 module of the ISS, involving more than 2,200 K-12 students from 32 states. In 2009, NASA solicited public input to name the Node 3 module of the ISS, receiving more than one million poll responses. Astronauts on Shuttle and ISS missions are also using social media, such as Facebook and Twitter, to let people become a more direct part of these missions. Social media posts and real-time blog discussions inform the public prior to and during each mission, both for human missions but also for the expendable launch vehicles that carry scientific missions into space. Launches and industry interviews broadcast live on NASA TV to inform the public and encourage students to study the sciences that will help ensure NASA continues to lead the world in aerospace exploration as well as research and technology development.

How This Fits into Open Government

From the beginning of human space exploration, we have been making our activities public in real-time. This allows people to get the sense of 'being there' and learning along with our astronauts and other professionals. To achieve our goals in space exploration, we must collaborate with other government agencies, industry, as well as international partners. With the ISS as the newest National Laboratory, there will be increased opportunity to collaborate with universities and research activities.

Useful Links

1. The Space Shuttle Program: www.nasa.gov/shuttle
2. The Space Station Program: www.nasa.gov/station/
3. ISS: www.nasa.gov/mission_pages/station/main/index.html
4. ISS Daily Reports:
www.nasa.gov/directorates/somd/reports/iss_reports/index.html
5. ISS Research www.nasa.gov/mission_pages/station/science/index.html
6. ISS National Lab www.nasa.gov/mission_pages/station/science/nlab/index.html

High Schools United with NASA to Create Hardware (HUNCH)

www.nasa.gov/offices/education/programs/descriptions/HUNCH.html



HUNCH students at Clear Creek High School in Texas building training hardware

One of the more interesting HUNCH projects is a dining table for space station astronauts. The table has a vacuum system that sucks up stray food particles and keeps them out of the hardware used aboard the space station. To test the table's vacuum function, a group of Clear Creek students were the first students in the nation to fly aboard a zero-gravity plane, which NASA uses to train astronauts. The students spent a total of five hours on the plane during two flights. During the flights, students tested the vacuum's air flow, suction and filter systems. Astronauts are scheduled to take the 74-by-32-inch, aluminum table to the space station sometime this year.

7. View a Rocket Launch:
www.nasa.gov/centers/kennedy/launchingrockets/viewing.html

Aeronautics Research Mission Directorate and Open Government*Conduct Aeronautics Research for Societal Benefit*

www.aeronautics.nasa.gov

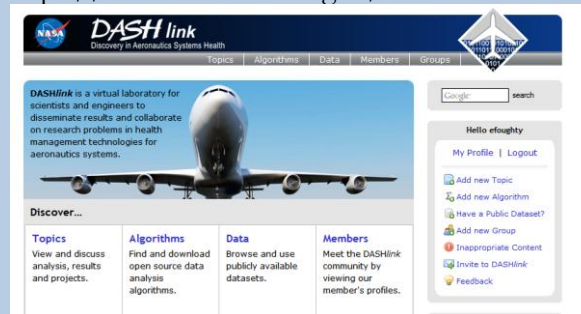
☒ Transparency ☒ Participation ☒ Collaboration

The Aeronautics Research Mission Directorate (ARMD) uses a balanced research and development portfolio to explore early-stage innovative ideas, develop new air vehicle technologies and air traffic operational procedures, and demonstrate the potential of promising new vehicles, operations, and safety technology. Our goals are to expand aviation system capacity, enable fuel-efficient flight planning, reduce the overall environmental footprint of airplanes today and in the future, reduce delays on the ground and in the sky, and improve the ability to operate in all weather conditions while maintaining the current high aviation safety standards. We address research challenges that must be overcome in order to enable the Next Generation Air Transportation System (NextGen) and the vehicles that will operate within it. Partnerships and citizen engagement are essential to our research.

Overview

NASA's tradition of applied aeronautics research extends to the early years of the twentieth century, with the establishment of the National Advisory Committee for Aeronautics (NACA) in 1915. Until NASA's founding in 1958, the NACA was the nation's premiere federally funded aeronautics-research Agency. NASA ARMD continues our long and strong tradition of close and robust partnerships with industry, academia, and other government agencies. Citizen outreach likewise remains essential as ARMD is committed to participation and collaboration in all areas of aeronautics research.

Because partnerships are crucial, NASA ARMD has established mechanisms to engage academia and industry, including industry working groups and technical interchange meetings at the program and project levels. Additional key components include Space Act Agreements (SAAs) for cooperative partnerships with industry, and NASA Research Announcements (NRAs) that provide full and open competition for

NASA's ARMD and DASHlink<https://dashlink.arc.nasa.gov/>*Screenshot of DASHlink Webpage*

DASHlink is a virtual laboratory for scientists and engineers to disseminate results and collaborate on research problems in health management technologies for aeronautics systems. Web-2.0-style content generation and social-software technologies, along with a community-moderated posting policy, make it easier and faster for NASA aeronautics researchers and research partners to share data and knowledge with each other and the general public. Participants can upload technical projects to disseminate, collaborate, and innovate more easily both within NASA and beyond. DASHlink connects researchers working in similar areas, permitting the upload of open-source algorithms and downloading of public data.

the best and most promising research ideas.

Cooperative partnerships with industry result in a significant pooling of resources for all partners. Currently, ARMD has in place 78 SAAs with different members of the aerospace industry. These collaborative opportunities have produced significant research results at the system level, where the expertise of industry and NASA come together to integrate technologies that could, one day, be incorporated into the nation's aircraft fleet. Since 2006, ARMD has awarded a total of 385 total NRA research efforts.

Fostering new generations of highly skilled scientists and engineers is critically important to the aeronautics community. As part of our commitment to furthering this field, we are restructuring our education program to focus investments on undergraduate and graduate education. The program aims to attract highly motivated undergraduate and graduate students to aeronautics and related fields.

How This Fits into Open Government

ARMD encourages collaborative research and development and the dissemination of aeronautics systems data, algorithms, and results to NASA, other agencies, and the public. Our community of researchers is broadened through the many collaborative partnerships with Federal Agencies, academia, and industry. This ensures that our research has the widest possible reach and impact.

Useful Links

1. NASA Aeronautics Programs: www.aeronautics.nasa.gov/programs.htm
2. NASA Aeronautics Research Announcements: www.aeronautics.nasa.gov/nra.htm
3. NASA Research Opportunities (NSPIRES): nspires.nasaprs.com
4. NASA Aeronautics Partnerships: www.aeronautics.nasa.gov/partners.htm
5. NASA Aeronautics Scholarships: nasa.asee.org/about_the_program

Science Mission Directorate and Open Government

America's Space Program: Scientific Discoveries for Everyone

nasascience.nasa.gov

☒ Transparency ☒ Participation ☒ Collaboration

NASA leads the nation on a great journey of discovery, seeking new knowledge and understanding of our planet Earth, our Sun and solar system, and the universe out to its farthest reaches and back to its earliest moments of existence. NASA's Science Mission Directorate (SMD) uses space observatories to conduct scientific studies of the Earth from space, to visit and return samples from other bodies in the solar system, and to peer out into our Galaxy and beyond. Through our publicly available mission data sets, education and public outreach programs, Web sites, and other participatory exploration programs, we continue to extend our long tradition of openness and active community involvement in scientific exploration.

Overview

For years NASA's science program has been dedicated to openness, making all information public, and inviting participation in all aspects of NASA's science program. Early in NASA's history, we created a policy for all raw science data received from spacecraft to be stored in a publicly accessible archive for future researchers. As researchers conduct NASA-funded experiments, many of the results are published in peer-reviewed journals. But more than benefiting from just the results of these efforts, NASA engages the scientific community to help steer our science program in several ways:

- Prioritizing destinations of missions.
- Targeting future technologies.
- Posing the questions to be answered in astrophysics, Earth science, heliophysics, and planetary science.

Our flight missions range from suborbital projects—including balloons, sounding rockets, and airplanes—to interplanetary probes and flagship observatories. All investigations and missions selected and flown must respond to science goals and strategic

NASA and SERVIR

www.nasa.gov/mission_pages/servir/



Screenshot of real-time weather and earthquake visualizations on www.servir.net

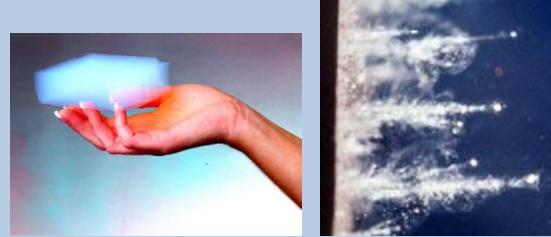
The SERVIR regional visualization and monitoring system integrates Earth satellite observations and forecast models with data gathered on the ground for timely decision making to benefit society. SERVIR helps scientists, government leaders, and local communities address concerns related to natural disasters, disease outbreaks, climate change, and biodiversity. Begun in Latin America in 2005, a second node was created in Nairobi, Kenya in 2008. Thanks to this partnership, which includes USAID, the UN, and other organizations, our publicly available data helps to improve lives across the globe.

objectives that were crafted by the input from the science community. The majority of the approximately 70 spacecraft currently operating in space are selected after a competition. When we issue an Announcement of Opportunity, this is open for universities, NASA Centers, non-profits, Federally Funded Research and Development Centers (FFRDCs), industry, and international partners (on a no-exchange-of-funds basis). Finally, we also have a very robust research and analysis program and announce our Research Opportunities in the Space and Earth Sciences (or ROSES) together with other solicitation on the NSPIRES Web site (nspires.nasaprs.com). We use a peer review process to evaluate and select research proposals submitted in response to research announcements and archive previous solicitations and selections on the NSPIRES Web site.

We require our missions have robust education and public outreach (E/PO) programs. As policy, each mission dedicates at least one percent of their prime mission cost to E/PO, which equates to approximately \$35 million annually. Many of the citizen engagement activities and participatory exploration projects come from the result of this policy. As an example of participatory exploration, through “DAWN Clickworkers” the public can help us count craters on two of the largest minor planets in our solar system—Ceres and Vesta. This information will help us better understand the age and impact history of their surface.

Stardust @ Home

stardustathome.ssl.berkeley.edu/



Aerogel material in the Stardust Mission (left), tracks in aerogel that mark stardust entry and capture (right)

The Stardust mission returned the first pristine interstellar dust ever collected in space, and scientists are eager to “get their hands” on them. But first the particles have to be found! We estimate that Stardust collected only around 45 interstellar dust particles. They are tiny—only about a micron (a millionth of a meter) in size and are embedded in an aerogel collector 1,000 square centimeters in size. We used an automated scanning microscope to collect digital images of the Stardust interstellar collector at different depths, stacked images into movies giving us nearly a million movies to analyze. Thousands of Stardust@home volunteers around the world can view them with a special Virtual Microscope on the Web. Instead of taking years, this collaboration will accelerate the process down to several months to analyze the first interstellar dust particles brought to Earth.

We understand the linkage between exciting scientific discovery and the aspirations for students to pursue science, technology, engineering and mathematics (STEM) degrees. As such, we provide university students the opportunity to develop, build, and operate science instruments on NASA spacecraft through our Student Collaboration activity. Initially started as a “bonus” criteria for new missions, we now have a new policy where Principle Investigators on NASA science missions are provided with an incentive (up to 0.5 percent of the cost of the mission) to fund the Student Collaboration. Such efforts could involve the development of an instrument, investigation of scientific questions, data analysis or modeling, development of supporting hardware or software, or other aspects of the mission. As an example, undergraduate students will operate Mooncam, the Student Collaboration on the GRAIL mission and provide the images to middle school students.

How This Fits into Open Government

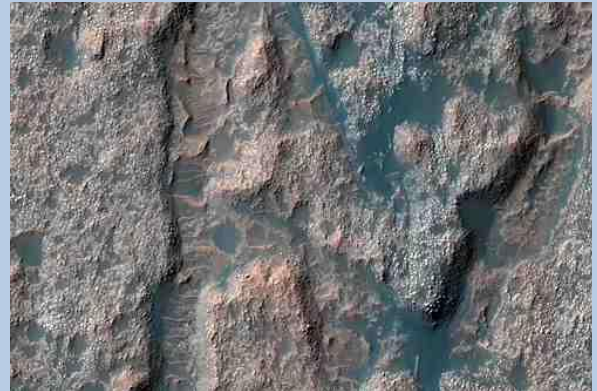
We are a community of scientists and instill the principles of transparency, participation, and collaboration in everything we do to better understand our home planet, our sun, our solar system and the universe beyond. From establishing science priorities, selecting missions, conducting research, to making discoveries, a community of scientists, engineers, and sometimes even the general public play a pivotal role in ensuring our success. Since our mission data is publicly available on the Web anyone in the world can look at it and educators can freely get images and mission information for classrooms. We will continue to experiment with new ways of doing business and collaborating with new stakeholders. As demonstrated with E/PO and Student Collaboration, as successes occur we will solidify our practices with appropriate policy.

Useful Links

1. NASA Science Missions: science.nasa.gov/missions
2. NASA Science Research Programs: sara.nasa.gov
3. NSPIRES – NASA Research Opportunities: nspires.nasaprs.com
4. Student Collaborations: http://nasascience.nasa.gov/researchers/education-public-outreach/explanatory-guide-to-smd-e-po-evaluation-actors/SMD_SC_Guide_1_1%20508.pdf
5. NASA Science Partnerships: nasascience.nasa.gov/about-us/science-strategy/interagency-agreements/partnerships-table

HiRISE Captures Public-Selected Images

<http://uahirise.org/hiwish>



Deposits on the Floor of Palos Crater, one of eight public-selected images taken on Mars by the HiRISE camera.

On March 31, 2010, the High Resolution Imaging Science Experiment (HiRISE) on the Mars Reconnaissance Orbiter delivered eight new pictures of Mars' surface that were all suggested by the public.

Exploration Systems Mission Directorate and Open Government*Creating Technologies and Capabilities for the Expansion of Humanity into the Solar System*<http://www.nasa.gov/exploration>

☒ Transparency ☒ Participation ☒

Collaboration

NASA's Exploration Systems Mission Directorate (ESMD) manages the development of capabilities for long-duration human and robotic exploration, including human transportation elements, robotic precursors to scout targets for future human activities, demonstrations of technologies that could reduce the cost and expand the capability of future space exploration activities, and the creation of innovative life support and medical technologies. We focus on increasing participation in exploration activities by a wider and more diverse group of both new and established partners. Today, other federal agencies, industry, and academia actively participate with NASA, and we work extensively with other space-faring nations to collaborate on mutually beneficial plans for the future exploration of space. We are also focused now on identifying and pursuing innovative ways in which to meaningfully engage the general public in NASA exploration activities.

Overview

NASA is entering a new era in human exploration that will leverage American ingenuity and propel the nation on a new journey of innovation and discovery.

Groundbreaking new technologies will enable exploration of new worlds and increase our understanding of the Earth, our solar system and the universe beyond. Further collaborations on the International Space Station will increase NASA's return on investment and provide an optimal test bed for space technology research and development. The President's FY 2011 budget proposes canceling the Constellation Program and developing several new initiatives that will foster a sustainable human space exploration program.

NASA doesn't intend to embark on this new journey alone. Commercial and international partnerships will benefit from a collective spirit of discovery and adventure, and will reduce the cost of space exploration by employing new business practices and leveraging common goals. NASA also invites citizen stakeholders to participate and share in the excitement of space exploration

Commercial Crew and Cargo Program<http://www.nasa.gov/offices/c3po/home/index.html>

Commercial Crew and Cargo Program
NASA is partnering with industry in new ways. The Commercial Crew and Cargo Program (C3PO) is exemplary of NASA's shift to becoming a buyer of space services by setting clear requirements and then taking a hands-off management approach to enable maximum use of innovative, cost-effective commercial practices. The C3PO is responsible for challenging private industry to establish capabilities and services that can open new space markets, support the crew and cargo transportation needs of the International Space Station, and provide future services for exploration.

through upcoming initiatives designed to educate as well as glean new, creative ideas from standard and unconventional contributors.

Many of the activities within ESMD will continue. We have been at the forefront of conducting robotic exploration with the Lunar Reconnaissance Orbiter and the Lunar Crater Observation and Sensing Satellite (LCROSS) and have performed human analogue research in simulated environments from the desert to the Antarctic to the ocean floor. We have conducted key technology demonstrations such as the Crew Escape System for launch vehicles to thermal protection systems for re-entry capsules. The President's FY 2011 budget proposes NASA will reconnoiter the solar system's resources and test new technologies that will enable vast improvements in our exploration capabilities. Partnerships have always been a key element of long-term missions. Space exploration is a complex endeavor that requires the application and integration of a broad range of technical capabilities, expertise, and resources. We have adopted an open and inclusive approach to engaging international space agencies that perform space exploration activities. NASA has a long history of including interested parties that desire to discuss their objectives and plans.

In 2007, we joined 13 other space agencies to establish a global exploration strategy and a supporting international coordination framework. The international coordination enabled by this framework includes the identification of common goals and objectives, the sharing of information regarding space exploration capabilities, the exchange of scientific data, the development of international standards, and the development of reference system architectures for exploration.

The program of robotic precursor missions and technology demonstrations outlined in the President's FY 2011 budget will provide great opportunity for increased collaboration as well as for infusing other Open Government principles into the new programs.

How this fits into Open Government

We are focused on achieving the objective of increasing the participation in our exploration activities with a wider and more diverse group, and as we extend our presence beyond the cradle of Earth, we will share this responsibility with both new and established partners. In

Pavilion Lake Research Project

<http://www.pavilionlake.com>



Deepworker at Pavilion Lake and The Lunar Electric Rover

The Pavilion Lake Research Project (PLRP), conducted in British Columbia, Canada, is a multi-disciplinary science and exploration mission to explain the origin of freshwater microbialites. NASA conducts analog missions at Pavilion Lake because the extreme, remote location will provide a challenging setting to test and develop research and exploration methods. Collecting microbialite samples will help improve techniques for future space exploration missions and scientific research. The project is a pilot for an Analog Missions Program to train astronauts in field science activities and to help develop exploration success metrics and protocols for future human operations on the Moon and Mars.

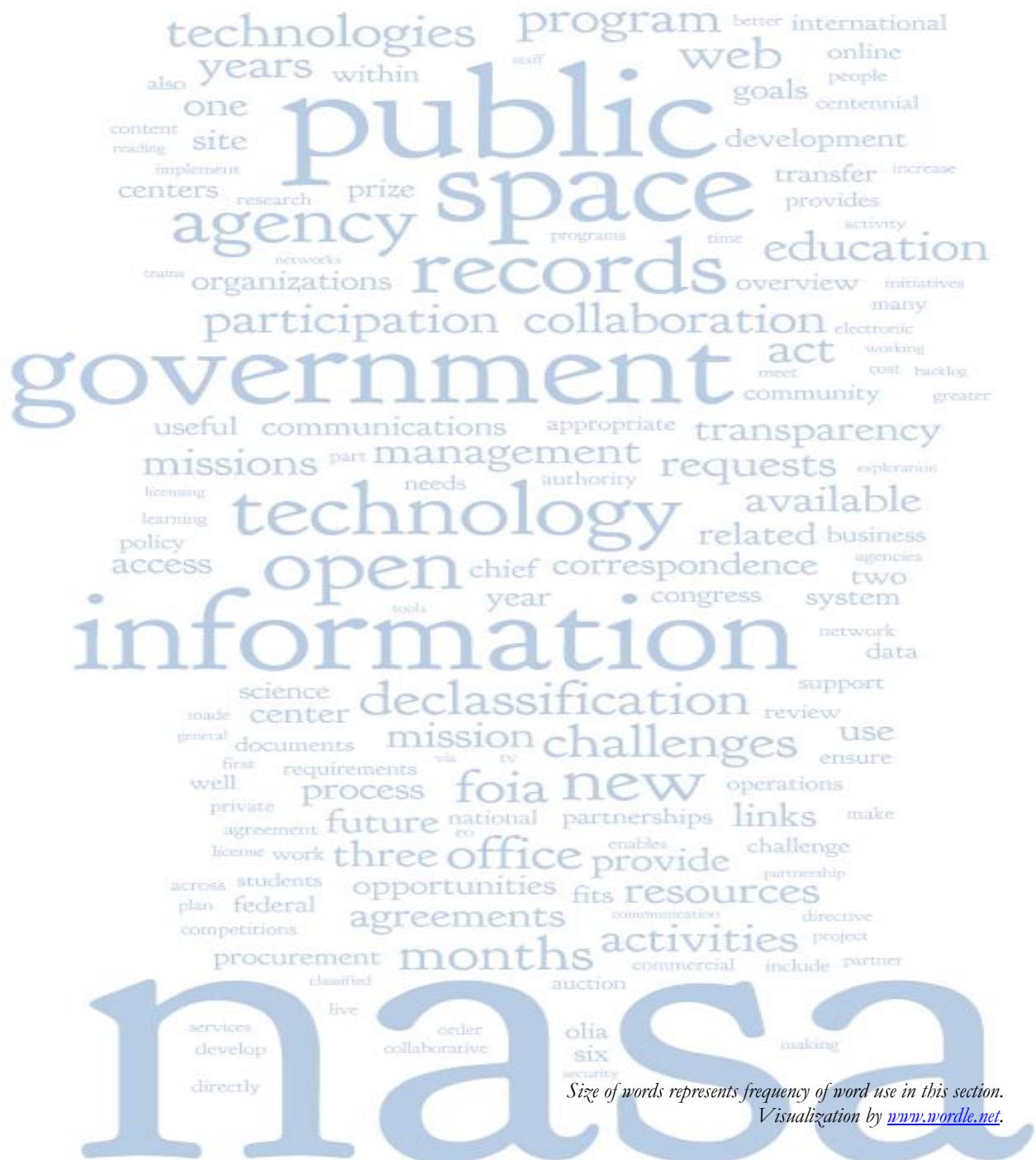
working to extend knowledge and develop innovative solutions to human health challenges, we competitively award grants to researchers from academia, industry and other federal agencies. We will continue to work to increase the ability of small, medium, and large organizations to participate as partners in NASA's goals of exploration and discovery.

Useful Links

1. <http://www.nasa.gov/exploration/home/index.html> - ESMD home page
2. http://www.nasa.gov/home/hqnews/2010/feb/HQ_10-039_Edu_Texas_Instruments.html Human Research Project and Texas Instruments Use Human Spaceflight to Bring Math and Science Topics into High School Classrooms
3. <http://pds.nasa.gov> –View the newest images of the Earth's moon from LRO
4. <http://www.nasa.gov/directorates/esmd/home/analog.html> - ESMD analog studies
5. www.nasa.gov/pdf/178109main_ges_framework.pdf - Global Exploration report

Ongoing Open Government Activities

This section aims to provide a detailed overview of just some of the many NASA activities that exemplify the ideals of the Open Government Directive. These overviews will be supplemented through anecdotes of successful programs using Open Government frameworks and contain goals and milestones for making the program even more transparent, participatory, and collaborative.



Freedom of Information Act (FOIA) at NASA*Making NASA Information Public for More Than 40 Years*www.hq.nasa.gov/office/pao/FOIA/agency/☒ Transparency ☒ Participation ☐ Collaboration

The Freedom of Information Act, enacted in 1966, provides the public access to the way the government conducts their business. This law established for the first time an effective statutory right of access to government information. NASA's FOIA program has, and continues to be, in the forefront of making documents available to the public through answering individual requests received and making frequently requested documents available on the Web. Each of NASA's 10 Centers maintains a FOIA Web site with contact information, information on how to make a request, and a reading room with frequently requested documents published for the public's use.

Overview

The NASA FOIA program is placed in the Public Affairs Offices across the Agency. NASA maintains a decentralized FOIA process, in which we operate and staff FOIA Requester Service Centers at each of our 13 NASA centers or components. This approach enables NASA to reduce our FOIA request processing time and provides a faster response to our requesters. NASA received 1,226 FOIA requests in 2009 with 601 being processed in 20 days or fewer. Only 22 of the 1,226 processed requests were appealed. A complete description of our staffing, organizational structure, and process for analyzing and responding to FOIA requests can be found in our Annual Reports and our Main Web page (see Useful Links).

The type of requests varies from different NASA locations. Center requests deal more with contracts while NASA headquarters requests are more for Agency policy and decisions-making documents. When a request for the same document has been received the third time, it is considered a "frequently requested document" and is placed in the FOIA reading room at the Center it was requested. Each center is required to maintain a reading room to make it easier for requesters to access documents of greater interest.

In 2009, we conducted an assessment of our processes for handling and expediting FOIA requests and decided to transition to

Columbia Accidentwww.nasa.gov/columbia/foia/

STS-107 taking off on January 16, 2003

Immediately after the Columbia accident, the FOIA office, and many other offices through NASA, developed a plan to use FOIA as a way of informing the public of the accident. The Central FOIA reading room would collect all released documents in regarding the accident. This was an unprecedented move in FOIA processing across government to use FOIA as a primary means of communication in a time of crisis and without a request. While there was uncertainty, the result of swift movement and pro-active processing yielded greater internal, governmental and public support.

a single, Web-based system for handling all FOIA requests across the 13 NASA locations. This will allow requesters to see where their request is in the process, allowing our staff to focus on responding to active requests. This shift will allow greater insight into the FOIA process, greater accessibility of existing public information, and streamline efforts internally to allow our staff to focus on responding the requests.

Challenges still exist. We currently have a backlog of 276 requests at three of our Centers. From our 2009 Annual Report, the oldest FOIA request in the backlog is close to four years old. We are continually making strides in reducing this backlog at each of these centers with other FOIA personnel helping to reduce the backlog and ensure appropriate expertise on staff. We are on schedule to have the backlog significantly reduced by 10 percent in compliance with the DOJ guidelines by the end of the year.

How This Fits into Open Government

The FOIA has and continues to provide documents to the public through answering of specific requests and maintain reading rooms with documents previously released published. NASA has always had the policy that FOIA requests were to be looked at what can we release instead of what can we withheld. We have maintained a policy of openness from the inception of NASA and the FOIA.

Open Government Goals

- Three months
 - Ensure Web site reading rooms are up to date by posting documents for which three or more requests have been made.
- Six months
 - Provide Web-based access to check the status of submitted requests through our FOIAExpress database.
- One year
 - Consolidate the 13 Agency electronic reading rooms into a one-stop location and refine the public indexing of documents.
 - Decrease by 10 percent the number of FOIA backlogs.
 - Decrease by 11 months the oldest backlog on file.
- Two years
 - Eliminate legacy FOIA database and become solely reliant on our newly procured Web-based database.
 - Create better user experience of reading rooms with integrated public accessibility of the Web-based FOIAExpress system.
 - Decrease by 10 percent the number of FOIA backlogs.
 - Decrease by 11 months the oldest backlog on file.

Useful Links

1. Annual Reports 1999-2009: www.hq.nasa.gov/office/pao/FOIA/report.

2. NASA Procedural Requirements:
nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPRandc=1441ands=1D
3. NASA FOIA Requester Service Center Addresses:
www.hq.nasa.gov/office/pao/FOIA/requester-centers.pdf
4. NASA FOIA Public Liaison Officers:
www.hq.nasa.gov/office/pao/FOIA/Pub_Lia_Officers.pdf
5. Availability of Agency Records to Members of the Public:
www.hq.nasa.gov/pao/FOIA/fedregix.html

Congressional Requests for Informationlegislative.nasa.gov/☒ Transparency ☐ Participation ☐ Collaboration

The Office of Legislative and Intergovernmental Affairs (OLIA) manages correspondence and requests for information received from the U.S. Congress and handles requests for legislative material. OLIA has procedures in place to ensure requests are handled quickly and in a consistent manner. OLIA's newsletter keeps the public informed of its activities with Congress.

Overview

The OLIA is responsible for the following:

- Monitoring legislative activity.
- Maintaining liaison with Members of Congress and its staff.
- Acquiring and disseminating all legislative material for NASA.
- Controlling, tracking, and responding to all correspondence addressed from Congress to NASA.

To ensure consistency and quality, official NASA correspondence to Members of Congress are signed by the Administrator, Deputy Administrator, or the Associate Administrator for Legislative and Intergovernmental Affairs. The Office of Inspector General is exempt from the signature policy noted here. When the OLIA determines it is appropriate, Center Directors and other Officials-In-Charge may be authorized to sign correspondence to Congress.

Most correspondence from Congress is received by OLIA, which logs and tracks each piece of correspondence. Correspondence clearly addressed to specific NASA officials, the Office of the Inspector General, or a labor union official are an exception and are delivered unopened to the addressee. OLIA has a goal of responding to correspondence expeditiously, within 30 days if possible. More details on OLIA procedures can be found in the Useful Links section below.

NASA does not abridge the rights of our employees to communicate with Congress as private citizens on their own time and without using Government resources.

How This Fits into Open Government

NASA's responses to Congressional requests for information make the Agency more transparent by

Mission Statement

The Office of Legislative and Intergovernmental Affairs provides executive leadership, direction, and coordination for all communications and relationships, both legislative and non-legislative, between NASA and the United States Congress, as well as state and local governments.

enabling the Congress to better understand how NASA fulfills its mission. The information provided in each communication touches on OLIA's executive leadership, direction, and coordination of all communications and relationships related to legislative issues between NASA, the U.S. Congress, state and local government, space-related associations, and citizens groups.

Open Government Goals

- Three to Six Months
 - Review our processes and policies on what is already routinely made available to the public via our Web site and what additional items could be made available through our Web site.
- One to Two Years
 - Review the system in place. Ask for input from NASA and public stakeholders on how well the system is meeting their needs, analyze lag time to Web publication, and any further refinements the system needs.

Useful Links

1. Organization Chart of OLIA: legislative.nasa.gov/OLIA%20org%20chart%202011-09.pdf
2. Handling Congressional Correspondence And Information Concerning Congressional Activities:
nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPRandc=1450ands=4G)
3. Senate Committee Web pages with Jurisdiction over NASA:
commerce.senate.gov/public/
4. House Committee Web pages with Jurisdiction over NASA: science.house.gov/

"A Look at NASA" – Making Information Publicly Accessible legislative.nasa.gov/newsletter.pdf



This newsletter shares highlights of what the Agency is doing with Congress and members of the public. The newsletter routinely covers White House interaction with the Agency and other major NASA initiatives.

NASA Declassification Management Program

www.hq.nasa.gov/office/ospp/

☒ Transparency ☐ Participation ☐ Collaboration

The primary objective of the NASA Declassification Program is to review all historically valuable classified information to assess what needs to remain classified and what can be released to the public while protecting the national security interests of the United States Government. The NASA Declassification Program establishes the roles and responsibilities of the Mission Directorates, NASA Records Managers, FOIA Officers, Center Program Offices, Declassification Authorities (DCAs) and Center Protective Services Offices for completing declassification actions Agency wide. This program establishes procedures within the NASA Procedural Requirements (NPRs) that will ensure that mandatory declassification reviews, systematic reviews, and overall classification management requirements are completed in accordance with the mandates set out in pertinent Executive Orders.

Overview

On April 17, 1995, President Clinton signed an Executive Order (EO 12958) that provided a uniform system for classifying, safeguarding, and declassifying national security information. This EO required that all classified information more than 25 years old deemed of historical value shall be automatically declassified within five years whether or not the records have been reviewed. On November 19, 1999, President Clinton signed a new Executive Order (EO 13142) that provided an extension of three years to satisfy the requirements of EO 12958. On March 25, 2003, President Bush signed his own Executive Order (EO 13292) as an amendment to EO 12958 to extend the deadline for declassification review until December 31, 2006.

Although NASA had numerous challenges to meet this deadline, we succeeded by reviewing more than eight million documents and declassifying more than five million. The 25 Year Automatic Declassification Review is a sliding requirement that takes place every year.

President Obama has clarified and updated requirements of Agency declassification programs through a new EO 13526 as part of his push for openness in government.

In order for us to meet the requirements of the Executive Order, the Agency must remain engaged and involved in the declassification effort. The trained and officially appointed DCA is responsible for reviewing the records for continued classification or declassification. The NASA Security Management Division will continue to provide training and certification for all NASA DCAs to ensure maximum transparency. We will also perform random quality control checks on records to ensure compliance with EOs.

How This Fits into Open Government

Declassification is the first step toward making previously classified information available to the public. The process we have in place requires inter-NASA collaboration to determine what is considered classified and when something can be declassified. Declassification of government information that no longer needs protection, in accordance with established procedures, is essential to the free flow of information

Open Government Goals

- Three months
 - Update the Office of Protective Services Web site, which includes information about our declassification programs and how to access declassified materials.
 - Improve the workflow between all the participants that play a role in the successful administration of the Declassification Program Agency wide.
- Six months
 - Provide a process where the public can provide input on what types of information should be prioritized for declassification.
 - Continue to improve the Declassification process to better meet the needs of the public.
- One year
 - Ensure that the appropriate funding and human resources are allocated to continue the Declassification Program at the current level.
 - Conduct an industry survey and benchmarking exercise across government to determine if Web-based tools can assist in the declassification process.
- Two years
 - Implement recommendations from the industry survey and benchmarking exercise.

CORONA Program

<http://msl.jpl.nasa.gov/programs/corona.html>



Recovery of Discoverer 14 return capsule

The Corona program was a series of U.S. photographic surveillance satellites used from the late 50s through the early 70s. The satellites used film canisters that were returned to earth in capsules (a.k.a. “buckets”) for evaluation. Corona was officially secret until 1992. In 1995 the imagery acquired by the Corona (and other programs) was declassified. The declassified imagery has since been used by a team of scientists to locate and explore ancient habitation sites, pottery factories, megalithic tombs, and Palaeolithic remains in northern Syria.

Useful Links

1. The Information Security Oversight Office (ISOO): www.archives.gov/isoo
2. Electronic Code of Aeronautics and Space Regulations:
ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&ndtpl=/ecfrbrowse/Title14/14cfr1203_main_02.tpl
3. NASA Handbook for Writing Security Classification Guides:
www.hq.nasa.gov/office/ospp/documents/scg_guide.pdf

NASA Records Management

Managing NASA's Records

<http://www.nasa.gov/offices/ocio/recmgmt/index.html>

☒ Transparency ☒ Participation ☐ Collaboration

Records document all aspects of NASA's business—its organizations, policies, decisions, achievements, and operations. Documented records—contained on paper, micrographics, and audiovisual and electronic media—are managed as information resources. Information in the form of records is a critical resource necessary to assure the success of the Space program and preserve its history. The objectives of NASA records management are to:

- Make current and inactive records available for employee use.
- Preserve significant records for future engineers and our Nation's history.
- Legally dispose of all other records.

Overview

Appropriate management of NASA records is vital to the future success of the Agency as well as for recording many aspects of our nation's history. Through close collaboration with the National Archives and Records Administration (NARA), NASA works diligently to ensure that records are maintained in an appropriate manner per issued directives. Items of significant historical meaning are transferred to the NARA for permanent storage, while other records are kept for a prescribed number of years and made available to NASA employees for research before being appropriately destroyed.

Maintaining appropriate records is a responsibility of every employee. Consequently, we created a mandatory training program for all civil servants, and recommended to contractors, to ensure everyone understands his or her responsibilities and the procedures for appropriately keeping and disposing of records. Additionally, we instituted a NASA-wide awareness campaign with promotional posters and information to infuse this message into our culture.

Electronic records have brought us a new era of records management. While electronic records make many tasks easier and more

Digital Archiving and Partnerships

<http://www.nasaimages.org>

<https://archive-it.org/public/collection.html?id=1740>



NASA partners with Internet Archive to archive digital imagery

NASA has implemented an agreement with the non-profit Internet Archive (IA) whereby IA manages an Internet site, [nasaimages.org](http://www.nasaimages.org), to provide free access and downloads of NASA still photography, video and film, including High Definition. Therefore, in essence, IA serves as custodian of much of NASA's current and legacy digital imagery records. In addition, IA will help digitize NASA's historically significant, analog images for inclusion on the Web site, enabling digital archiving with the National Archives and greater public access to these records via the IA Website.

Strictly on its own initiative, IA recently began to capture NASA's publicly posted social media content. NASA is considering exploration of how this activity might be leveraged for records management purposes.

efficient, they also present a difficult challenge for recordkeeping. The trainings ensure employees know proper management practices for both electronic and physical records.

Via successive Agency-wide data calls through the OCIO during FY07 and FY08, the Agency built an inventory of more than 3,000 electronic systems and applications. Upon analysis with of the systems, 1,330 were found to contain true records that were subsequently categorized into 54 subject categories drawn from NASA's Agency Filing Scheme. We have ensured the existence retention schedules for records in 95 percent of the systems with a projected completion date of June 30, 2010.

We are participating in NARA's Electronic Records Archives (ERA) Pilot Phase 2. This activity tests agencies' capability to conduct records management business with NARA electronically through their ERA. We will request new retention schedule approvals and transfer records ownership to NARA via ERA.

How This Fits into Open Government

Effective management of records increases transparency and opportunities for collaboration between various NASA centers, contractors, and public institutions. Leveraging existing resources to enable quicker and easier access to existing records and ensuring records-management processes are followed enables the agency to encourage public dissemination of its data and its capture for use by future generations.

Goals related to Open Government

- Three Months
 - Complete electronic records schedules for records in the remaining 5 percent systems and submit to NARA for approval.
 - Participate in NARA's ERA Pilot Phase 2.
 - Participate in NARA's Web 2.0 Study of agencies' use of social media technologies.
- Six Months

Records Management Training Course

<https://saturn.nasa.gov/>



Mandatory Civil Servant Course on Records Management and an awareness campaign

Since 2008, NASA Civil Servants have been required to take records management training courses through SATERN, NASA's online training center. The training covers how to identify records that must be archived, transfer records to the records management system, and find additional resources for help. NASA has also opened the training to contractors, allowing broader access to the material. More advanced records management training courses are available to employees who wish to learn more, covering long-term storage of records as well as ways in which the records are released to the public or archived.

- Update NASA Records Management public website to direct the public to the NASA FOIA process for obtaining NASA records not publicly available.
 - Cooperate with NARA on any ERA pilot activity follow-up.
- One Year
 - Work with NARA Electronic Records working group to understand potential improvements other agencies and organizations have implemented in their respective records management processes.
 - Continue use of ERA for conducting records management transactions, including transfer of NASA records to this agency charged with the capturing and preserving Federal government records for future generations.
- Two Years
 - Evaluate suitability of NARA working group recommendations, implement, if feasible, improved records management processes.

Useful Links

1. NASA Records Management – NASA Policy Directive (NPD) 1440.6H:
nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PD_1440_006H_andpage_name=mainandsearch_term=npd%201440.6h
2. NASA Records Retention Schedule – NASA Policy Directive (NPD) 1441.1D:
nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PR_1441_001D_andpage_name=main
3. National Archives Records Management Handbook: www.archives.gov/records-mgmt/handbook/

Office of Procurement and Open Government

www.hq.nasa.gov/office/procurement

☒ Transparency ☒ Participation ☐ Collaboration

The mission of the Office of Procurement is to provide functional management, leadership, and policy direction of purchasing and financial assistance activities for NASA (excluding Space Act Agreements). Our goal is to ensure the Agency executes its mission successfully by effectively and efficiently managing the acquisition process. In the interest of furthering the principles of Open Government, we will be gauging interest through feedback in how the public can be more involved in our activities. Within the next year we plan to use a contest format to challenge NASA's procurement community to identifying new information to be shared with the public. Within two years we plan to develop an on-line best practices guide for NASA procurement professionals to stimulate new collaboration.

Overview

Information we publicly provide is authorized to be shared by statute, regulation, or other Federal directive, or is information that the Agency, or the Assistant Administrator for Procurement at NASA, has determined to also be appropriate to share. Not every piece of information we collect can be shared in a public forum nor is all information of interest to the public. Typically, there are four segments of the public that are our prime consumers.

They are:

1. Enterprises looking for business opportunities with NASA as prime contractors, subcontractors, vendors, suppliers, sub-grantees, or as Agency partners;
2. Educational institutions;
3. Other Federal Agencies; and
4. Individuals.

In 2009, approximately 83 percent of NASA's budget was spent through the Agency's procurement process. This represents more than \$16.7 billion dollars in opportunities. Some of our information represents the most important sharing opportunities we, as procurement professionals, are charged by law with presenting to the public. Others—like the NASA Procurement Tenets, NASA Acquisition Internet Service Business Opportunities subscription service, and our Source Selection Statements—represent forward leaning efforts designed to help you understand what we are doing and how we conduct ourselves in the execution of our mission.

How This Fits into Open Government

Procurement has always shared information with the public regarding opportunities and expenditures. We believe that the President's Open Government Directive, and the public feedback it invites, will help us identify additional sharing opportunities and better ways to present our information.

Open Government Goals

- Three months
 - Monitor and measure feedback from the Open Government Plan on Office of Procurement and Open Government, Financial Data Transparency, and Data.gov sections.
- Six months
 - Develop new content and modify existing content based on public feedback.
 - Implement any additional OMB instructions as the directive is further defined.
- One year
 - Use a contest format to challenge NASA's procurement community to identify new information that could be shared with the public or better ways to share existing content.
 - Invite finalists to present their ideas at a NASA Procurement Leadership Forum where they will be recognized.
- Two years
 - Develop an on-line "Best Practices" guide for NASA procurement professionals that will continue to stimulate new sharing and presentation ideas. The intent is to excite new employees about this opportunity as well as to keep the intent of the President's Open Government Directive fresh in the minds of our community.

Useful Links

1. Federal Business Opportunities:
www.fbo.gov/

Useful Links



Federal Business Opportunities (FBO) provides a searchable format for Federal Contract Business Opportunities and Award Notices. You can also view NASA Grant (assistance award) notices on this site. You can view NASA specific data at:
<http://go.usa.gov/ig6>



Federal Procurement Data System - Next Generation (FPDS-NG) Agencies report all contract actions using appropriated funds to this site. You can view NASA specific data at:
<http://go.usa.gov/igF>



Grants.gov is the source to FIND and APPLY for Federal grants. You can view a current list of NASA grants (assistance award) opportunities at:
<http://go.usa.gov/igL>



Research.gov The National Science Foundation (NSF) is partnering with NASA, Defense Research agencies, and USDA/CSREES on Research.gov to deliver services that align with the needs of the research community and Federal Agency partners. You can view NASA information on Research.gov by selecting "NASA" in the Agency dropdown list and click the search button at:
<http://go.usa.gov/igM>

2. Federal Procurement Data System - Next Generation (FPDS-NG): www.fpds.gov
3. Grants.gov: www.grants.gov
4. Research.gov: www.research.gov

NASA Public Affairs Web Initiatives

Connect with the Universe

www.nasa.gov

☒ Transparency ☒ Participation ☒ Collaboration

NASA uses a variety of methods on the Internet to involve the public with its missions. At the forefront stands NASA.gov—an unparalleled wealth of information concerning NASA activities around the world. Additionally, we emphasize the use of social media applications in order to directly reach out to the public. Tens of thousands of people follow NASA activities on the official NASA Facebook page. NASA TV content on YouTube is one of the top ranked channels with more than one million people who followed Astronaut Mike Massimino’s adventures as he was on the STS-125 Hubble repair mission in 2009.

Overview

The first NASA Web sites appeared in the early 1990s, and the Agency’s primary site, www.nasa.gov, has evolved since then through four major iterations. The most recent version, released in 2007, enables the Agency to be more participatory with the public through a variety of social features. Dozens of NASA employees blog on blogs.nasa.gov, sharing personal accounts of their experiences while working for the Agency. Visitors can comment on and rate news articles and other content. Features such as NASA chats enable the public to directly communication with NASA experts about topics they are curious about.

We have been exploring social media for several years, connecting employees to each other and with the public. These connections not only give a more personal side to our exploration, they help employees collaborate more effectively. In 2008, the Mars Phoenix mission landed on the North Pole and began looking for ice. When ice was found, NASA’s Jet Propulsion Lab tweeted @MarsPhoenix to tell the world, “Are you ready to celebrate? Well, get ready: We have ICE!!!! Yes, ICE, *WATER ICE* on Mars! woot!!! Best day ever!!!”

A social media policy is under consideration. So far different programs and NASA Centers have issued guidance for their employees. We have relied on our professional staff to use appropriate decorum and understand that social media is just another communications medium. An approach

NASA Twitter Activities

twitter.com/NASA



NASA Tweet-up attendees in the Apollo Launch Control Center at Johnson Space Center in Houston, Texas

More than 320,000 people follow NASA’s main Twitter account, which shares real-time information on NASA news, activities, and mission information. NASA has organized events, called “Tweet-ups,” where members of the public have close encounters with NASA facilities and experts across the country. Apart from NASA.gov, about 20 astronauts and hundreds of individual NASA employees tweet on personal accounts, giving members of the public an up-close and personal insight on the activities going on inside the agency.

that involves trusting our workforce, learning from missteps, and celebrating successes will continue with whatever policy is issued.

These initiatives, among others, have resulted in a huge increase in the amount of people who visit NASA on the Web. In 2009, the main NASA.gov home page received nearly 250 million visits, enabling NASA content to reach more people than ever before. Additionally, the main NASA page is the recipient of two Webby awards, and NASA social media channels received more votes for 2009 Shorty awards than any other government Agency.

How This Fits into Open Government

The NASA.gov Web page offers thousands of opportunities for the public to view details and discuss NASA missions and operations. More than 600 people have accounts on NASA.gov's content management system, resulting in a vast array of published information from across the Agency. Additionally, the site is connected to more than 100 different social media feeds, inviting visitors to participate and collaborate on NASA initiatives through interfaces which they are familiar with. Our approach toward embracing new communication mediums and trusting our workforce has created a positive culture around the Internet.

Open Government Goals

- Three Months
 - Deploy new Flash-based on-demand video player that enables the public to comment and discuss videos posted to the Web site.
 - Increase opportunities for public to directly connect with NASA experts through channels such as NASA chats.
- Six Months
 - Transition to new support contract allowing greater

NASA Web Facts in 2009

4.4 1.8

Page Views
(in Billions)

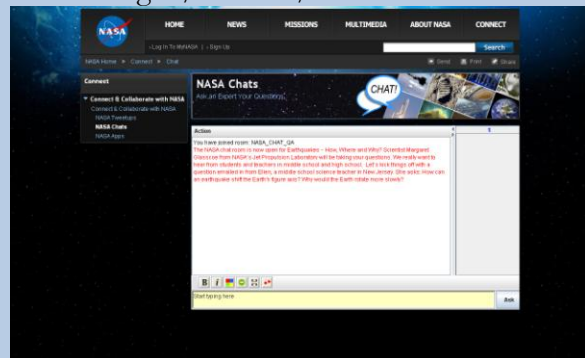
Web content delivered
(in Petabytes)

21,231

Total Time Spent by visitors on NASA.gov
(in days)

NASA Chats

www.nasa.gov/connect/chat



Start of a NASA Chatroom

NASA Chats are an opportunity for the public to ask the experts who work at NASA questions about a given subject and get real-time answers. These question and answer sessions between the public and NASA scientists, engineers, and support personnel are a perfect opportunity to allow for more direct knowledge to be shared. Opportunities in the NASA Chats exist for students to learn more about science, technology, and engineering as well as general questions about NASA's activities and missions.

- use of computer resources for NASA.gov projects.
- Release a policy on Social Media at NASA, if appropriate.
- One and Two Years
 - Work to streamline Internet operations and continue to explore new initiatives to connect with users interested in NASA.

Useful Links

1. Collect and Collaborate with NASA: www.nasa.gov/connect/index.html
2. NASA TV: www.nasa.gov/ntv
3. Image of the Day Gallery: www.nasa.gov/multimedia/imagegallery/iotd.html
4. NASA Media Resources: www.nasa.gov/news/reports/index.html
5. NASA Blogs: blogs.nasa.gov

NASA Television

Opening the Eyes of the World to NASA Activities

www.nasa.gov/ntv

☒ Transparency ☒ Participation ☒ Collaboration

NASA TV provides detailed information on Agency activities, missions, and news both directly to the public and to various media outlets for use in news reports and documentaries.

Overview

NASA TV's primary purpose is support of the space shuttle and International Space Station programs. Mission success and the safety of the astronauts depend on a robust communications infrastructure that allows engineers and scientists to visually assess a crew's well-being and safe vehicle operations. NASA Television also delivers education material to schools, museums, and other learning institutions while providing news organizations with video, still images, interviews, and news conferences. NASA Television is redistributed by cable and satellite television providers to the general public.

How This Fits into Open Government

NASA Television's availability on cable television systems, satellite television services, and the Web via nasa.gov enables the American public and an international audience to view NASA missions, news conferences, and other activities in real time. By transmitting these programs to a wide audience, NASA TV increases the transparency of our projects and involves the public in the exciting missions we undertake.

NASA Television collaborates with other agencies, such as DOE, NOAA, DOD, and Department of State, to produce videos, special events, and live coverage of expendable vehicle launches.

Open Government Goals

- Six Months
 - Upgrade NASA Television distribution system to high definition video quality in order to provide a better experience to viewers.
- One Year
 - Implement online on-demand video

NASA on YouTube

www.youtube.com/NASATelevision



Screenshot of NASA TV's YouTube Page

NASA videos have become some of the most popular content available on YouTube. Over 750 videos are available for on-demand viewing, with new content added daily. Soon, NASA Television will begin providing high-definition content, allowing visitors to view videos in even higher clarity and detail.

system for high-definition content.

Useful Links

1. Connect and Collaborate with NASA: www.nasa.gov/connect/index.html
2. NASA on YouTube: www.youtube.com/NASATelevision
3. NASA TV: www.nasa.gov/multimedia/nasatv
4. NASA TV Schedule: www.nasa.gov/multimedia/nasatv/schedule.html
5. NASA on Your TV:
www.nasa.gov/multimedia/nasatv/nasa_on_tv_schedule.html
6. NASA Audio File: www.nasa.gov/news/media/audiofile/index.html

NASA Education Activities

Leveraging Technology to Involve, Inspire, and Educate the Public

www.nasa.gov/education

☒ Transparency ☒ Participation ☒ Collaboration

NASA's Office of Education (OE) communicates education resources and information about NASA's missions and technological and scientific advances to numerous stakeholders. We actively engage students, educators, parents, and the general public through a variety of resources from downloadable learning guides on our Web site to engagement via a vast social networking presence. Our interactive resources include collaboration tools for access to NASA experts, virtual worlds that simulate space travel, and online remote controls to scientific instruments and that enable the students to directly take part in space missions.

Overview

The NASA Education Web site is the central gateway for students, teachers, parents, and the general public to access NASA mission and education information and resources. Through this Web site, which has tailored content for various educational audiences and grade levels, NASA provides more than 3000 educator resources via an interactive searchable database, with potential access to over 10,000 online education resources.

The site allows access to education multimedia, including NASA eClips and NASA TV Education File. The site also provides annual reports and mechanisms for visitors to provide feedback and ask questions. The NASA Education Web site consistently receives between 3.5 and 4.5 million page views per month, with its most popular educator guides downloaded more than 20,000 times per month.

More than just providing downloadable materials, NASA's collaborative tools facilitate peer-to-peer interactions and allow students and teachers to engage directly with NASA experts. Examples include:

- The NASA Student Ambassadors Virtual Community links current and former NASA interns and fellows.
- The Interdisciplinary Science Project Incorporating Research Experience (INSPIRE) provides an online learning community where students

Learning Technologies Virtual Worlds

www.nasa.gov/offices/education/programs/national/lt/p/



NASA eEducation Island in Second Life

NASA Learning Technology (LT) is researching virtual worlds as platforms for learning, collaboration, networking, and event delivery. The NASA eEducation Island in Second Life is a space to facilitate NASA education projects' entry into virtual worlds. Building on prior research and development, LT's Information Accessibility Lab is also collaborating with multiple industry and academic partners on methods of making three-dimensional virtual worlds accessible to the blind and visually-impaired.

to interact with their peers, NASA experts, and education specialists.

- The Endeavor Science Teacher Certificate Project is an online collaborative learning environment with online courses and “action research.”
- NASA’s Museum Alliance is an online community of practice of more than 350 informal organizations with access to resources, information, and events.

NASA’s greater Web and telecommunications activities include mechanisms for participatory exploration, real-time interaction, and virtual worlds:

- The Digital Learning Network (DLN) enables two-way audio and video conferences and live interaction between classrooms and NASA personnel.
- ISS EarthKAM enables students to remotely direct a camera on ISS to capture real time images of Earth.
- The Space Grant Internet Telescope Network (SGITN) allows students and faculty to use astronomical equipment locally and remotely.
- Amateur Radio on the International Space Station (ARISS) provides opportunities for students to use amateur radio to speak with astronauts on ISS.
- NASA’s multiplayer online science, technology, engineering, and mathematics (STEM) learning game is in development for release in 2010 and NASA manages a presence in Second Life.

Online tools help NASA communicate its activities in support of organizational improvement. These include:

- The Weekly Activity Report (WAR) tool (see sidebar).
- The NASATalk collaborative wiki and blog for internal and external groups.

How This Fits into Open Government

Educators want to know how to access materials related to NASA missions, and students want to find out more about NASA and how to participate in education programs. Members of the general public are interested in learning about NASA missions and participating in challenges and activities. All audiences need to easily and quickly access current information regarding

Education Weekly Activity Report Tool education.jsc.nasa.gov/WAR



NASA Education WAR Tool Homepage

The Office of Education uses an electronic Weekly Activity Report (WAR) tool to capture and report significant activities and upcoming events that are taking place across the Agency. The purpose of the WAR tool is for sharing key education activities and major milestones (current and upcoming) with staff, managers, and leadership. Over the past six years 16,000 individual submissions have been received and 324 weekly reports have been generated. The tool is hosted on a public server that can be accessed by the public. It facilitates internal transparency and promotes efficiency and effectiveness by reducing redundancies between groups working towards similar goals from geographically disperse locations.

NASA's education activities and the resources we make available contribute to transparency. As shown in examples from the previous section, the NASA education Web site facilitates online participation and collaboration. Online mechanisms for internal and external reporting of NASA Education activities further promote teamwork, transparency, collaboration, and awareness.

Open Government Goals

- Three months
 - Fully establish online collaborative tools as part of future education events and activities with external stakeholders.
- Six months
 - Increase the functionality of the Education WAR tool to support Agency transparency by determining portions of the report to be made available on NASA's public Web site, implementing appropriate links on the NASA's public Web site for WAR information, and providing selected portions of the WAR archive to Data.gov.
- One year
 - Complete a comprehensive internal and external communications plan that will have Open Government values and the Agency Open Government plan as its foundation. This plan will identify various communications channels related to participatory exploration and types of feedback sought. OE will also strategically address competitions in support of participation, collaboration, and innovation in education.
- Two years
 - Implement the components of its communication plan using an Agency-approved interactive collaboration and idea submission tool. The plan will be related to ongoing engagement of education stakeholders and audiences nationwide and dependent on Agency agreements, resources, and policies. To complement this, a strategy for collection, analysis, actions, and related reporting will be developed.
 - Develop and implement strategies and mechanisms to provide feedback to the public regarding the results of collaborations and idea submissions, including explanation of related actions.

Useful Links

1. NASA Office of Education: www.nasa.gov/education
2. NASA Education Open Government: www.nasa.gov/education/open
3. NASA Student Ambassadors Virtual Community: intern.nasa.gov
4. The Interdisciplinary Science Project Incorporating Research Experience (INSPIRE): www.nasa.gov/education/inspire
5. The Endeavor Science Teacher Certificate Project:
www.nasa.gov/offices/education/programs/descriptions/Endeavor_Science_Teaching_Certificate_Project.html
6. NASA's Museum Alliance: informal.jpl.nasa.gov
7. NASA Digital Learning Network: dln.nasa.gov
8. ISS EarthKAM: lorax.earthkam.ucsd.edu/public/about
9. The Space Grant Internet Telescope Network (SGITN): sgitn.space.edu/

10. Amateur Radio on the International Space Station (ARISS):
spaceflight.nasa.gov/station/reference/radio/
11. Science Technology, Engineering, and Mathematics (STEM) in Second Life:
www.nasa.gov/audience/foreducators/virtual-education.html
12. NASA Education WAR Archives: education.jsc.nasa.gov/WAR/archive/default.cfm
13. The NASATalk Collaborative wiki: www.nasatalk.com
14. Central Operation of Resources for Educators:
education1.nasa.gov/edprograms/core/home/

NASA Space Communications and Navigation

Keeping the Universe Connected

spacecomm.nasa.gov

☒ Transparency ☒ Participation ☒ Collaboration

NASA's reliable space communications and navigation (SCaN) networks are the backbone of all of NASA's space missions, providing the critical communication services for all Earth, space science, and human space flight missions. This includes all of the telemetry, tracking, and commanding (TTandC) required by each spacecraft to transfer key data to the ground systems to manage space operations, as well as the voice communications with the human space flight missions and data transfer for all of the Earth and space science missions. These networks enable NASA to show live broadcasts to the public of its exciting events including launches, astronaut extra-vehicular activity (EVAs), life and work on-board the International Space Station (ISS), and the Mars Rovers' exploration of our neighboring planet.

Overview

NASA's space communications and navigation services are provided by three integral networks:

- The Near Earth Network (NEN).
- The Space Network (SN) and its related Tracking and Data Relay Satellite System (TDRSS) of geo-stationary satellites.
- The Deep Space Network (DSN).

The NEN, which includes commercial services obtained on a per pass basis, provides orbital communications support for near-Earth orbiting customer platforms via various NASA ground stations. The SN provides communications support to spacecraft in Earth vicinity, including the Space Shuttle and the ISS. The DSN is an international network of large antennas and communication facilities that supports interplanetary spacecraft missions, and radio and radar astronomy observations for the exploration of the solar system and the universe. All of NASA's live footage from space is provided through these networks.

Deep Space Network

deepspace.jpl.nasa.gov



Sunset shot of the 70m antenna at Goldstone, California.

The Goldstone Deep Space Communications Complex, located in the Mojave Desert in California, is one of three complexes that comprise NASA's Deep Space Network (DSN). The DSN provides radio communications for all of NASA's interplanetary spacecraft and is also used for radio astronomy and radar observations of the solar system and the universe.

NASA's amazing successes, like the landing of the Mars Rovers and their journeys across the red planet, as well as the tragedies during our history have all been brought to the American people live and unfiltered through these communication networks. The Earth science data from the many spacecraft studying our home planet are all made available to scientists through these networks, to learn about our climate and help protect our home planet.

How This Fits into Open Government

NASA's SCaN networks promote transparency by providing the live video feeds of all major human spaceflight operations, such as launch, landing, docking, undocking, all space walks, major on-orbit assembly operations, and extensive coverage of daily life on-board the ISS. NASA is working to expand the range of activities in which people can participate. NASA works closely with many international space agencies to coordinate critical space communications standards and spectrum requirements necessary for successful communications, without external interferences, as well as to find areas of collaboration and cooperation. Such global standards will aid in interoperability between systems and ease the transition for commercial entities to differentiate.

NASA actively participates with the Department of Commerce's National Telecommunications and Information Administration and the Department of State to develop United States positions on the critical radiofrequency spectrum assignments needed for all of NASA's missions, and negotiates those positions within appropriate international fora, such as the World Radiocommunications Conference. NASA also participates in other international collaborative organizations such as the Interagency Operations Advisory Group.

Open Government Goals

- Three months
 - Participate in the Discovery Channel's program about the bearings replacement on the 70-meter "Mars antenna" at Goldstone Deep Space Communications Complex in Mojave Desert, CA.

Live Space Station Video

www.nasa.gov/ntv (click on 'Live Space Station Video' Channel on the Right)



The Soyuz TMA-13 spacecraft docks at the International Space Station on October 14, 2008.

Since March 2009, NASA has begun streaming video online from the International Space Station (ISS). Live ISS video includes internal views from cameras in the ISS's Destiny Laboratory and Harmony module when the resident astronauts are on duty. Earth views from external cameras on the station's structure will be available during crew off-duty periods. Television from the station is available only when the complex is in contact with the ground through its high-speed communications antenna and NASA's Tracking and Data Relay Satellite System (TDRSS).

- Six months
 - Collaborate with United States Air Force to develop video about the many benefits of GPS to NASA and its missions.
- One year
 - Provide live downlink of some ISS data as part of NASA exhibits.
- Two years
 - Develop optical communications, which would enable high definition broadcasts from space.

Useful Links

1. Tracking and Data Relay Satellite System (TDRSS): scp.gsfc.nasa.gov/tdrs/
2. Deep Space Network: deepspace.jpl.nasa.gov/dsn/gavrt/index.html
3. Interagency Operations Advisory Group: www.ioag.org
4. Data Standards:
www.spacecomm.nasa.gov/spacecomm/programs/data_standards.cfm
5. Many SCaN Links: www.spacecomm.nasa.gov/spacecomm/Links/

Centennial Challenges

NASA Prizes for the Citizen-Inventor

www.nasa.gov/challenges

☐ Transparency ☒ Participation ☒ Collaboration

The Centennial Challenges program seeks new solutions to specific technical problems of interest to NASA. The Challenges, which encourage participatory research and development, are open to private companies, universities, independent teams, and individual inventors. Our original seven prize challenges have been successful in encouraging broad participation by a diverse group of innovators. Many of these technical challenges also have direct relevance to pressing national and global needs such as energy and transportation.

The Centennial Challenges program is a multi-year activity with funding from previous years available for on-going competitions until the challenges are met and the prize money is won. All of the Centennial Challenges funding is applied to the prize purses. The program relies on partnerships with non-profit organizations to administer each challenge.

Overview

The Centennial Challenges program was conceived in 2003 and its name refers to the centennial of the Wright Brothers' first powered flight and commemorates their spirit as independent inventors. We worked with our partners in Congress to amend the Space Act to include Section 304 – Prize Authority. The Prize Authority allows us to use appropriated money to competitively award cash prizes to stimulate innovation.

The first competitions were held in 2005. Between 2005 and 2009, 19 competition events have been held in 7 challenge areas. We have awarded \$4.5 million to 13 different teams. Most challenges have taken several years for competitors to achieve success.

Prize programs encourage diverse participation, which leads to different approaches to a solution. A measure of diversity is seen in the geographic distribution of participants (from Hawaii to Maine) that reaches far beyond the locations of the NASA Centers and major aerospace industries. The participating teams have included individual inventors, small startup companies, and university students and

Regolith Excavation Challenge

regolith.csewi.org/



Paul's Robotics, a student team, wins \$500,000 in the Regolith Excavation Challenge

In the third year of the Regolith Excavation Challenge, many teams were able to excavate and move significant amounts of the simulated lunar soil. Three teams did exceed the minimum requirement of excavating 150 kilograms in 30 minutes and the winning team excavated three times that amount. The first place winner was a team from Worcester Polytechnic Institute led by an undergraduate student named Paul Ventimiglia. Paul's team won half of a million dollars and immediately formed a robotics company. The most successful teams posted news of their progress on their Web sites and were in communication with each other throughout the period leading up to the competition.

professors. An example of multiple solution paths was seen in the 2009 Regolith Excavation Challenge when teams developed more than 20 different working prototypes that were demonstrated to our judges. When NASA does its own development, it typically budgets for only two working prototypes. All of these prototypes were developed at no cost to the government. NASA expended \$750,000 in prize money for three years of competitions around this challenge, with dozens of teams investing tens of thousands of hours.

The return on investment with prizes is exceptionally high as we only issue the prize funds when the accomplishment is demonstrated. We provide the prize money, which ends up being the only cost to NASA since non-profit organizations administer the competitions at no cost to the government. Teams must finance their own development efforts.

Prizes also raise visibility of NASA programs and generate interest in science and engineering. Live Web casts of Centennial Challenge competitions attract thousands of viewers across the nation and around the world. The 2009 Power Beaming competition resulted in more than 1,000 news articles and Web features.

The Centennial Challenges program offers a great opportunity for the government to encourage private individuals to pursue technology advances that will benefit society. It offers an opportunity to showcase the skill, determination, and creativity of these exceptional people. The Challenges are inspirational to the next generations of innovators by showing otherwise ordinary people doing extraordinary things, and having fun doing it.

How This Fits into Open Government

Opening the door to all interested individuals and groups and providing the incentives of prize money and publicity increases the chances that valuable new technologies will be developed. As part of that openness, the government does not manage the activities of the competitors. Instead, we set the challenges and teams work on their own to come up with solutions. Centennial Challenges has proven its value, not only with new technologies to meet our needs but by tapping new sources of innovation, leveraging the tax-payer investment to create new businesses and partnerships, and increasing public involvement in science and technology.

Lunar Lander Challenge

space.xprize.org/lunar-lander-challenge



X-Prize Organized Lunar Lander Challenge (left) and winner Masten Space Systems receives national recognition from industry (right).

Many prize competitors are already-existing small businesses. The competitions allow them to focus their efforts and provide them with visibility and credibility not easily attained in fields such as rocket propulsion, which are dominated by huge corporations. In this case Masten Space Systems created a lunar lander that could simulate trips between the Moon's surface and lunar orbit. Not only did they win the Challenge, they were recognized for their efforts as "Space Entrepreneur of the Year" by *Aviation Week* magazine.

Open Government Goals

- Three Months
 - Announce several new challenge topics, solicit bids, and select allied organizations to manage those new competitions.
 - Continue to work with existing allied organizations for three on-going challenges.
 - Increase participation by increasing publicity for the events, reaching out to potential new competitor communities and seeking new government partnerships and new venues for the competitions.
- Six Months
 - Execute the next round of ongoing Power Beaming and Strong Tether Challenges.
 - Work with the allied organization for the 2011 Green Flight Challenge.
 - Arrange partnerships for new challenges, post rules for public comment, and re-open the opportunity for public suggestions for new prize challenges.
- One Year
 - Plan and conduct the ongoing and new challenge competitions.
 - Hold a second Centennial Challenges Technical Symposium and a Recognition Ceremony, if we have had prize winners in 2011.
- Two Years
 - Aim for increased funding to allow for more ambitious challenges including prizes for actual spaceflight and exploration demonstrations (e.g., low cost access to space, activities on the International Space Station, lunar sample returns, etc.).

Useful Links

1. Prize Authority in the Space Act:
www.nasa.gov/offices/ogc/about/space_act1.html#Prize
2. Green Flight Competition: cafefoundation.org/v2/gfc_main.php
3. Strong Tether Competition: www.spaceelevatorgames.org/
4. Power Beaming Competition: www.spaceward.org
5. New Competition Suggestions:
www.nasa.gov/offices/ipp/innovation_incubator/centennial_challenges/future/ideas.html

The NASA Space Act Agreement*Partnering with NASA*

www.nasa.gov/offices/ipp/partnership_devel/

☒ Transparency ☒ Participation ☒ Collaboration

NASA uses Space Act Agreements as the primary vehicle for partnering with the external community. Space Act Agreements enable us to enter into partnerships with organizations that give us access to a wider range of technologies and capabilities that are not part of NASA's core competency. These partnerships expand our ability to meet the difficult technical challenge we face in space exploration, often at virtually no cost to the taxpayer. A solid partnership enables us to bring our expertise, assets, or information together with a partner's core competency to help further our goals for aeronautics research and space exploration while simultaneously furthering the mission of our partner. In this sense, all of our partnerships are strategic alliances.

Through Space Act Agreements we are able to engage a broad spectrum of partners from all disciplines in the public or private sector. Since NASA is a mission-driven Agency and relies heavily on technology, the majority of our Space Act Agreements aim to develop or mature dual-use technologies of relevancy to both NASA and our partner.

Overview

The National Aeronautics and Space Act of 1958 (herein, the Space Act), as amended (42 U.S.C. sec 2451 et seq.), authorizes NASA "to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work..." with domestic and foreign entities. Under this unique authority, NASA has entered into a large number of agreements with diverse organizations, both in the private and public sectors, in order to meet wide-ranging NASA mission and program requirements. The agreement partner can be a U.S. or foreign person or entity, and academic institution, a Federal, state, or local governmental unit, a foreign government, or an international organization, for profit, or not for profit.

It is NASA's continuing policy to use our broad authority to further NASA's missions and expand our ability to meet difficult technical challenges. "Space Act Agreements" thus entered into under NASA's "other transactions" authority establish a set of legally enforceable terms between NASA and the other party to the agreement. Space Act Agreements constitute Agency commitments of resources such as personnel, funding, services, equipment, expertise, information, or facilities. Space Act agreements can be reimbursable, non-reimbursable, and funded agreements. Reimbursable agreements involve NASA's costs associated with the undertaking to be reimbursed by the agreement partner, either in full or in part. Non-reimbursable agreements are those in which NASA is involved in a mutually beneficial activity that furthers the Agency's missions, wherein each party bears the cost of its participation, and there is no exchange of funds between the parties. Funded agreements are those under which NASA transfers appropriated funds to an agreement partner to accomplish an Agency mission.

How This Fits into Open Government

The NASA partnership portfolio is both broad and deep. NASA partners with external entities for a wide variety of reasons:

- Develop and mature technology needed by NASA's missions at a lower cost.
- Enhance NASA capabilities perform its mission.
- Engage with the public and our other stakeholders.
- Leverage and or supplement other NASA core missions, such as education and outreach.

NASA engages in about 250 new Space Act agreements each year, many of which involve the lease of unique NASA facilities and joint basic research with the U.S. private sector, academia, and other Federal agencies, as well as with foreign governments and other foreign entities. About half of NASA's partnership agreements involve the U.S. private sector. Agency partnership collaborations generally involve persons and entities primarily from sectors beyond NASA's traditional aerospace community. These initiatives constitute a grassroots open invitation to individuals and entities of all types to contribute their creative ideas for technologies that can be used in NASA's missions.

NASA implements its partnership development activities through offices at each of its 10 Centers. Since NASA's Centers each specialize in a set of particular technology areas (with some overlap), collaborative opportunities involving a particular technology area are best pursued at those Centers with the relevant expertise. NASA has developed an internal tool to streamline the process of partnership development and assure a consistent approach across the Agency.

Open Government Goals

- Three Months

NASA, GM Take Giant Leap in Robotic Technology

www.nasa.gov/topics/technology/features/robonaut.html



Robonaut2—or R2 for short—is the next generation dexterous robot.

Engineers and scientists from NASA and General Motors worked together through a Space Act Agreement at the agency's Johnson Space Center in Houston to build a new humanoid robot capable of working side by side with people. Using leading edge control, sensor and vision technologies, future robots could assist astronauts during hazardous space missions and help GM build safer cars and plants.

to

- Transition toward significantly greater development and maturation of technologies through dual use technology development partnering and initiatives involving the emerging commercial space community. NASA expects to see an increase in the number of partnerships focused on the development of the commercial space sector.
- Six Months
 - Redefine the NASA organization to have an Office of the Chief Technologist, which is planned for the beginning of FY 2011. This office will have greater and broader authority than predecessor organizations regarding technology development partnerships.
- One to Two Years
 - Increase resources to enhance reach and impact of Office of Chief Technologist mission, to include partnering initiatives involving Space Act agreements.

Useful Links

1. The Space Act: www.nasa.gov/offices/ogc/about/space_act1.html
2. Innovative Partnerships Program: www.nasa.gov/offices/ipp/home
3. How to Partner with NASA: www.nasa.gov/offices/ipp/partner/index.html
4. The Space Act Agreement Guide:
www.nasa.gov/pdf/289016main_Space%20Act%20Agreements%20Guide%202008.pdf
5. NASA Policy Directive (NPD) 1050.1H, “Authority to Enter into Space Act Agreements:” nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPDandc=1050ands=1H

NASA's Technology Transfer Activities

Sharing NASA's Inventions with the Nation

www.nasa.gov/offices/ipp/home/index.html

☒ Transparency ☒ Participation ☒ Collaboration

NASA transfers technology to the private sector and state and local governments by actively seeking licensees. More than 1,600 such technology transfer successes have been documented in NASA's *Spinoff Magazine* over the years, which include commercial applications in health and medicine, transportation, public safety, consumer goods, agriculture, environmental resources, computer technology, manufacturing, and energy conversion and use. Licensing terms are negotiated on a case-by-case basis, although terms of use are defined as narrowly as practical in every case. We are experimenting with new ways of licensing government owned patents, and in 2008 entered into an agreement with Ocean Tomo and successfully commercialized federally funded technology via a live-auction process.

Overview

The National Aeronautics and Space Act of 1958 and a series of subsequent laws identify the transfer of Federally-owned or originated technology as a national priority and an important mission of each Federal Agency. Technology transfer promotes commercial activity, encourages economic growth, and stimulates innovation in business and commerce.

Legislation specifically requires that each Federal Agency have a formal technology transfer program. The legislation (such as the Bayh-Dole Act of 1980) gives NASA both the authority to transfer technology as well as protect the Government's rights to its inventions. NASA generally seeks to protect those technologies having the greatest likelihood of being commercially applied. There are also cases where NASA does not apply protections, making technology available for free and unrestricted to anyone having an interest in its application.

NASA's available technologies number in the thousands and span a broad spectrum. Many are so generic that they can be applied in almost any key industrial sector. NASA endeavors to make the public aware of the opportunity to take advantage of our technologies through our

NASA Spinoff Database

www.sti.nasa.gov/spinoff/database



Spinoff is NASA's annual premier publication featuring successfully commercialized NASA technology. Since 1976, *Spinoff* has featured between 40 and 50 of these commercial products annually. *Spinoff* maintains a database of every technology published since its inception.

participation in conferences, trade shows, license auctions, and print publications.

NASA technologies available for license, as well as those technologies NASA elects to leave unprotected, can be searched at the NASA Techfinder portal. The collaborative NASA Techfinder database is compiled based on reports submitted by the Agency's inventors and catalogs technologies available for either licensing or using. There is also a compilation of success stories on TechFinder.

NASA *Tech Briefs Magazine* is a monthly publication that includes technologies available for licensing, technologies available at no cost, and NASA's technology needs for which NASA is seeking dual-use technology development partners. NASA *Spinoff Magazine* is an annual publication featuring about 50 NASA technology transfer successes in each issue. NASA *Technology Innovation Magazine* is a quarterly publication focused on applications of NASA technologies in specific industrial sectors. It provides information on NASA's technology needs and associated partnering opportunities and successes, as well as on NASA's partnering successes. When we showcase our technologies at professional conferences and industrial trade shows, we tailored our portfolio to the interests of the particular profession or industry. At these events we invite participation, responding to real-time and follow up inquiry. Additionally, we have created an RSS feed of our technologies available for licensing to make it easier for potential partners to stay informed on new developments.

In 2008 Innovative Partnerships Program (IPP) Office at Goddard Space Flight Center was seeking a new paradigm on how to license its patent portfolio and entered into an agreement with Ocean Tomo for public auctions of NASA patents. The regulations governing licensing of Government owned IP seemed at odds with the auction format, but the Goddard IPP Office devised a solution compatible with federal patent licensing. The solution was to license the patents to Ocean Tomo prior to the auction, and allow Ocean Tomo to auction the right to transfer their license to the winning bidder. October 30, 2008, Ocean Tomo's

RSS Feed of NASA Technologies Available for Licensing



www.nasa.gov/offices/ipp/home/rss_licensing.html

RSS stands for Really Simple Syndication and it is a way to subscribe to online information. The RSS feed for the Technologies Available for Licensing program was part of a multi-agency effort including NASA, NIH, NIST, USDA, and DOE. The effort is to create databases that can be placed in a common portal to help foster greater visibility of federal research and development that can be made available for use by others under a licensing agreement, under a belief that effective and open communication is vital for successful technology transfer. This RSS feed provides a link to NASA technologies available for licensing. The link provides the technology patent number, patent expiration date, an abstract regarding the specific technology, and point of contact with phone and e-mail address. The feed will soon be accessible on Data.gov.

eighth live-auction and their largest one to date with over 500 in attendance, successfully sold a government patent license through a public auction of intellectual property.

How This Fits into Open Government

Technology transfer promotes commercial activity, encourages economic growth, and stimulates innovation in business and commerce. NASA's transferrable technologies are made open to allow innovations that benefit the public and stimulate economic development.

Commercialization of NASA technologies via public auction increases the value of NASA technologies by putting those technologies to work in the economy sooner and in a mechanism more companies are familiar with. The auction format fosters a completely transparent

license transaction since the license terms and final sales price are public, and this agreement can be used for other government agencies.

NASA TechFinder Database Stats

(as of March 2010)

technology.nasa.gov

692

Licensing
Opportunities

408

Technology
Opportunities

1,196

Software
Technologies

1,250

Success Stories

Open Government Goals

- Three Months
 - Support and facilitate the emerging commercial space community by making it easier for NASA sponsored technologies to be found and commercially applied.
 - Successful completion of first public auction involving multiple NASA Field Centers.
- Six Months
 - A new NASA organization, Office of the Chief Technologist, will come into existence at the beginning of FY 2011, and have greater and broader authority than predecessor organizations regarding technology development partnerships as well as transfer out of NASA sponsored technologies.
 - Public auction format accessible by all NASA Field Centers under standardized process and terms.
- One to Two Years
 - Anticipated increased resources will enhance reach and impact of Office of Chief Technologist's mission, to include maturation and development of technologies that will provide an enlarged based of candidate inventions available for commercial application.

- Assist in the utilization of a public auction format in use across all Federal Laboratories with Auction Company providing a centralized integration and bundling of government IP portfolios from across agencies.

Useful Links

1. NASA Searchable Databases: www.nasa.gov/offices/ipp/resources/databases.html
2. NASA Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR): sbir.gsfc.nasa.gov/SBIR/SBIR.html
3. NASA TechFinderPortal: technology.nasa.gov
4. NASA Patent Abstract Bibliography: www.sti.nasa.gov/Pubs/patents/patents.html
5. NASA @ Home and City: www.nasa.gov/externalflash/nasacity/index2.htm

NASA Engineering Network and NASA Technical Report Server*Resources for the Aerospace Engineering Community*

oce.nasa.gov | ntrs.nasa.gov

☒ Transparency ☐ Participation ☒ Collaboration

The NASA Engineering Network is an integrated suite of tools that includes a search capability that mines resources from 45 engineering repositories and 1.4 million records, the Lessons Learned Information System of official NASA vetted lessons, communities of practice formed along engineering disciplines, and a portal to integrate these components. The NASA Technical Reports Server (NTRS) is a public database of NASA's current and historical technical literature. NTRS provides access to approximately 500,000 aerospace related citations, 90,000 full-text online documents, and 111,000 images and videos. The type of information found in NTRS includes conference papers, images, journal articles, photos, meeting papers, movies, patents, research reports, and technical videos.

Overview

Following the loss of NASA's Space Shuttle Challenger and crew in 1985, the NASA Lessons Learned program was formulated to assure that NASA's key knowledge is documented and made available to everyone, both the public and NASA personnel. Following the loss of NASA's Space Shuttle Columbia and crew in 2003, the Columbia Accident Investigation Board was convened to identify underlying causes of the accident. The Board determined that NASA's organizational structure and culture prevented it from being a learning organization. One proposed solution to this problem was the NASA Engineering Network (NEN), a suite of information retrieval and knowledge-sharing tools aimed at facilitating communication among engineers at all the NASA centers and affiliated contractors, thus taking knowledge sharing from availability to participation and collaboration.

The NASA Engineering Network grew out of extensive benchmarking with other government agencies as well as private industry. It includes a search capability to mine resources from multiple engineering repositories, the Lessons Learned Information System, communities of practice formed along engineering disciplines, an expertise locator, and a portal to integrate these components.

The NASA Engineering Network went live in 2005. Since that time, more than 50 repositories and 1.3 million records have been indexed and a dozen communities of practice have been established. Since 2006, it has become clear that by integrating key lessons with other search results and the communities of practice, the Agency is building a stronger learning culture. As the next generation of spacecraft is designed, the NASA Engineering Network will be there to support its engineering endeavors. Due to the technical nature of the information on the NEN, we must abide by International Traffic in Arms Regulations (ITAR) regulations and much of the NASA Engineering Network suite is available only within NASA. The Lessons Learned component and Office of the Chief Engineer Web site have been made available to the public.

The NASA Technical Reports server (NTRS) is NASA's Agency-wide primary release avenue to the public for its research and development (RandD) final technical reports and

other scientific and technical information. NTRS has been releasing information to the public since its inception via the Internet in 1994 and through its predecessor database before that.

NTRS integrates three separate information collections and enables search and retrieval of information through a common interface:

1. NACA Collection: Citations and reports from the National Advisory Committee for Aeronautics (NACA).
2. NASA Collection: Citations and documents created or sponsored by NASA. The NASA collection time period starts in 1958 and continues to the present.
3. NIX Collection: Citations and images, photos, movies and videos downloaded from the NASA Image eXchange and served out through NTRS. NIX is a separate system and users can go directly to the NIX to search imagery as well as through NTRS.

NTRS is heavily harvested by commercial search engines (e.g., Google, Bing, and Yahoo), U.S. Federal and international aerospace and space organizations, universities, and the public. It is run and maintained by the NASA Center for Aerospace Information (CASI), a NASA entity that collects, organizes, disseminates, and archives NASA's RandD information.

How This Fits into Open Government

The NASA Engineering Network (NEN) meets the Open Government initiative for transparency in its lessons learned system and case studies published on the public Office of the Chief Engineer Web site. Official vetted lessons learned evolve from both positive and negative outcomes experienced during work on NASA projects. The database goes back to the 1970s and allows the public to search and review lessons. In addition to transparency, NEN enables collaboration across all NASA centers and industry experts through its facilitated communities of practice. Engineers can ask experts technical questions, find information about test facilities and tools, and share relevant documents.

Lessons Learned Information Service

llis.nasa.gov



Mars Science Laboratory (MSL) in the Solar Thermal Vacuum (STV) test facility at NASA JPL

Lesson Learned #2237 in NASA's Lessons Learned Information Service (LLIS) highlights 10 recommendations in the areas of system test preparation and test execution and review. This is one example of hundreds of lessons learned publicly available. The LLIS is a Web service where users can browse by date, subject, center, and key words. With greater NASA partnership with industry, new partners can find and use lessons learned as they design and develop spaceflight vehicles and can lead to transfer of government learned knowledge as well as allow non-NASA entities to find subject matter experts within NASA.

NTRS information, which is the results of NASA's RandD activities, is released to the public for use, transfer of knowledge, and subsequent use. This allows the work that NASA does to be transparent and for public users to actively put the research and development to use commercially or in their private lives.

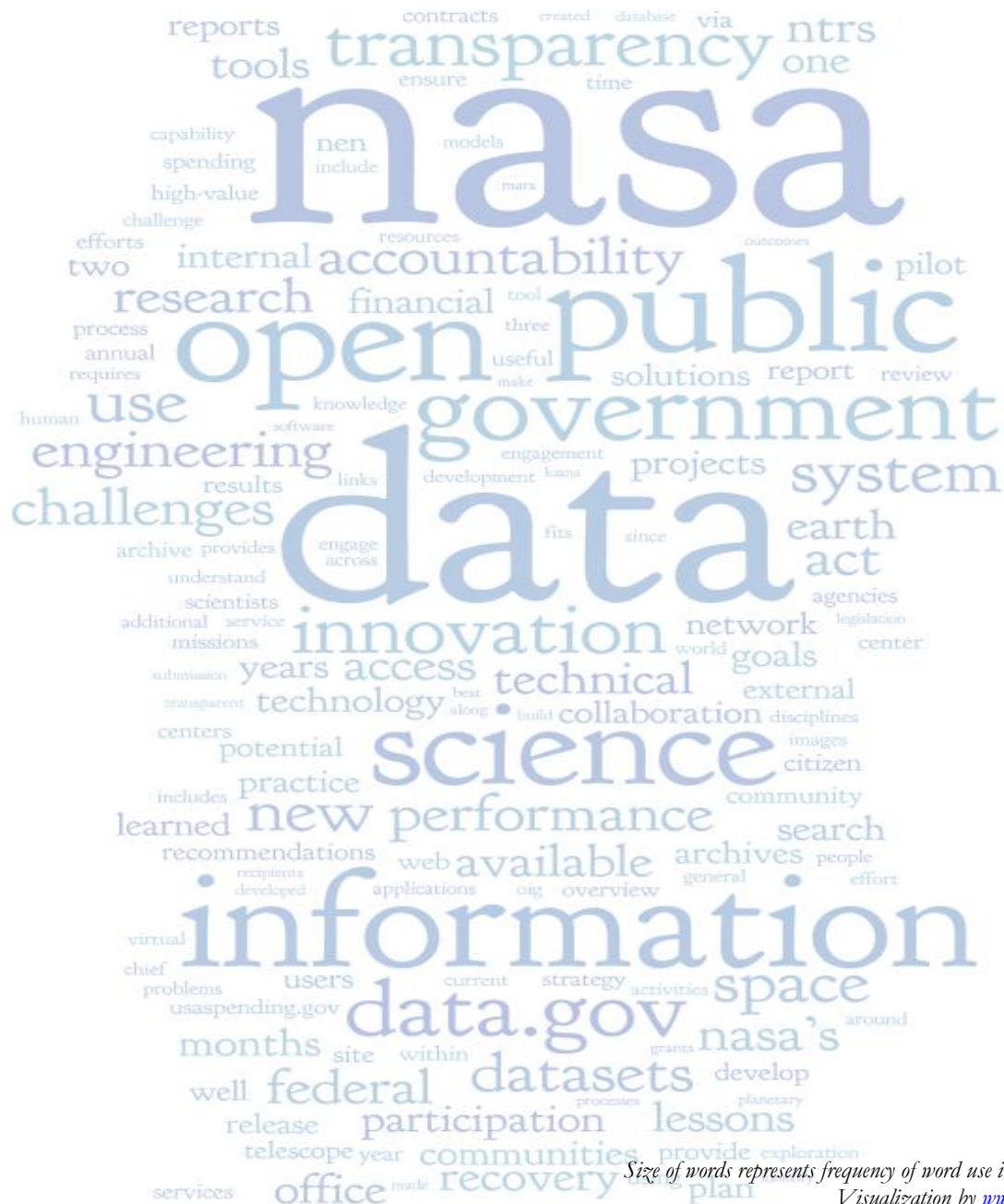
Open Government Goals

- Three months
 - Increase outreach to NEN users.
 - Enlist NEN champions for Office of the Chief Engineer site to ensure more information is made available on an ongoing basis.
- Six months
 - Improve NEN collaborative technology with new portal software.
 - Roll out five additional technical communities of practice in NEN.
 - Make NTRS visible and accessible to the public via Google Scholar.
 - Enable NTRS to be full-text searchable to better locate information.
- One year
 - Improve NEN search capability to give internal users better access to the information they seek.
- Two years
 - Improve NEN extranet capability to allow more external users from other government agencies, industry, and academia to participate in communities of practice.
 - Provide a new NTRS interface so information may more quickly be entered into the database, be more efficiently accessible and available for use by the public, and more easily harvested by the numerous entities that search for NASA's RandD information.

Useful Links

1. NASA Technical Report Server (NTRS): ntrs.nasa.gov
2. NASA Lessons Learned Information Service (LLIS): llis.nasa.gov
3. NASA Engineering Network (Internal Link): nen.nasa.gov
4. NASA Scientific and Technical Information (STI): www.sti.nasa.gov

Apart from the many activities NASA currently undertakes that align with the values of the Open Government Directive, several new initiatives are underway that promise to create new and exciting opportunities for the public to interact with the Agency. This section aims to introduce those initiatives to you, as well as describe how they hope to embody transparency, participation, and collaboration in their process from the start.



NASA and Data.gov*Discover. Participate. Engage.*

www.Data.gov

☒ Transparency ☒ Participation ☒ Collaboration

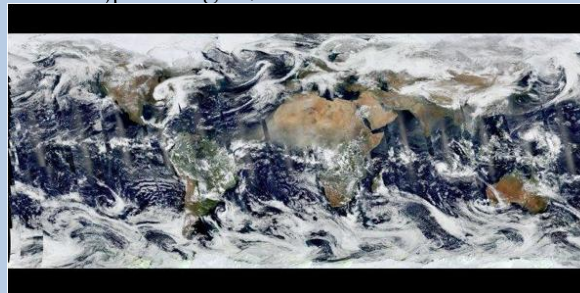
NASA provides billions of gigabytes (exabytes) of data from its rich history of planetary, lunar, terrestrial, and Earth-orbiting missions. From rocket testing to the geologic maps of Mars, our data has been available to the public via a variety of sites. Now, all that data will be accessible from Data.gov, either through raw data feeds, tools, or geospatial catalogues. As Data.gov continues to take shape and evolve from its initial release, we will continue to look for ways to use it to align, extend, complement, and provide amplifier effects for our data products. The platform provides an opportunity to release information not previously publicly available, such as administrative and procedural information within NASA. The public can find raw datasets to perform their own analysis, experiments, and learning. Developers can create applications that bring new insights and understandings of our Earth the universe, and the space program.

Overview

Data.gov was created in 2009 as a step toward implementing a more open and accountable government. Each Agency participates by providing support and recommendations to the architecture of the site as well as populating Data.gov with its data. For NASA, as a mission-driven Agency, data is at the heart of what we do. We have 100 years of government data on aeronautics, earth science, and space exploration and we have a process to archive data, manage existing data, and learn from real-time data.

Since NASA's inception, we have publicly archived data received from spacecraft projects, with thousands of gigabytes (terabytes) of new science data collected each day. We have tools and geodata catalogs available to allow scientists to access our data. When accessed through these Distributed Active Archive Centers (DAACs), tools, and catalogs, the user gets more value out of the aggregated data than he or she would with a single dataset. Our existing community of scientists and researchers rely on these resources to conduct their research.

An internal NASA Data.gov Working Group was formed to liaise between Data.gov and our data curators at NASA. We have participated in the evolution of data.gov to include tools and web services. By January 2010, NASA had submitted 519 datasets (including geodata) and 21 tools to

On Earthonearth.jpl.nasa.gov/*250m resolution AQUA/MODIS composite*

On Earth is the most current, near-global image of the earth available, **updated each day** in a KML format. Taken from the MODIS instrument on the Terra and Aqua spacecraft, this data will improve our understanding of global dynamics and processes occurring on the land, in the oceans, and in the lower atmosphere. This dataset is already available on Data.gov: <http://www.data.gov/raw/1620>

Data.gov. We identified three high value datasets and five high-value tools as part of the Open Government Directive. Below is a list of three high-value data products accessible via Data.gov:

- **Global Change Master**

Directory (gcmd.nasa.gov/) is an integrated platform with continuously updated information about the planet's vital signs, including the rising global temperature, size of the ozone hole, the rising sea level, and the amount of carbon dioxide in the atmosphere. The database holds more than 30,000 descriptions of Earth science data sets, services and ancillary descriptions covering all aspects of Earth and environmental sciences for fields from fisheries to remote sensing. The mission of the Global Change Master Directory is to offer a high quality resource for the discovery, access, and use of

Earth science data and data-related services worldwide, while specifically promoting the discovery and use of NASA data. The directory resource is targeted to serve as a valued location for sharing data from multinational sources and, in turn, will contribute to scientific research by providing stewardship of metadata and direct access to Earth science data and services.

- The **Planetary Data System** is an archive of data products from NASA planetary missions, and it has become a basic resource for scientists around the world. 55 missions have their data archived on PDS and through the search functionality, users can find the data of interest to download, rather than downloading the entire mission's data. Data hosted here is what has provided the baseline imagery for Google Moon and Google Mars.
- **NASA World Wind** (worldwind.arc.nasa.gov – see call-out in *Open Source at NASA* fact sheet) is a web service and open source project with nightly builds which allows people to zoom from satellite altitude into any place on Earth, leveraging satellite imagery and mission data, and thus experience Earth terrain in visually rich 3D. It is the world's best open source 3D geospatial viewer. NASA World Wind Java is also a plug in to allow third party users to use their own information and view it through the World Wind Java widget. Third party developers have developed a range of applications from visualizing Australia's continental data sets, a Search and Rescue application to assist in planning after an airplane goes mission to a 3D visualization of airspaces. 15 user applications and

Workforce Information Cubes for NASA

wicn.nssc.nasa.gov/generic.html



WICN Webservice of NASA's Workforce Data

The Workforce Strategy Division in the Office of Human Capital Management provides updated information about each NASA civil servant every two weeks. This information comes from the combination of multiple personnel and payroll systems, which includes the locations, occupations, grades, salaries, and demographics of NASA employees. This information goes back to 1993 and allows for analysts to forecast future activities, such as retirements by job and Center based on past experience or key personnel transition. This Web service will soon be available via Data.gov.

22 other applications and applets are available for download here:
worldwind.arc.nasa.gov/java/demos/.

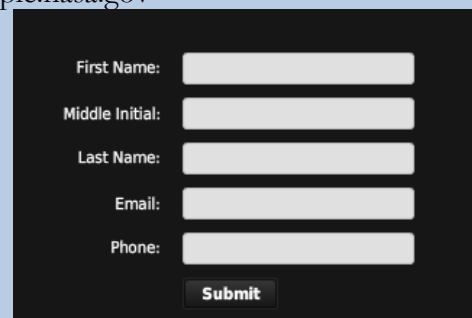
The Working Group understands the opportunity to reach out to new stakeholders via Data.gov, including application developers, social scientists, researchers, citizen scientists, and data enthusiasts. We believe that the Data.gov platform will facilitate even greater usage of our existing Web services which will provide incentive for us to find additional information to make available for download. We have identified numerous applications and web services to add to Data.gov and have targeted the following three for a May 2010 submission to Data.gov:

- Workforce Information Cubes at NASA – locations, occupations, grades, salaries, and demographics every NASA civil servant since 1993 (see above)
- Education Weekly Activity Report – weekly summaries from each Education office throughout NASA (see *Education and Open Government* section)
- NASA Enterprise Directory – name, address, and phone number of every NASA civil servant or contractor (see below)

Some of the lessons we learned from the Citizen Engagement Tool used during the development of this plan (opennasa.ideascale.com) is that it helps to understand what people are interested in as well as assist with internal collaboration between our employees. We are committed to receiving public and employee ideas for additional high-value datasets, particularly datasets from the institutional and procedural realms of our activities. We would like to have an open dialogue regarding proposed Data.gov submissions to ensure we are making available datasets that are of interest to our communities. Since some datasets take a considerable amount of time to ensure data quality (abiding by security and respective personally identifiable information) and translate their data structure into something of utility for Data.gov, we want to ensure stakeholders will use it. We believe this public dialogue will assist people to learn more about what currently exists, what can exist, identify the correct offices and data curators internally, and best of all give greater insight into the inner workings of the U.S. space program.

In summary, our strategy for moving forward includes the development of a useful public dialog to source, comment, and vote on proposed datasets to release to the public. The Working Group will work with our data curators and Office of the Chief Engineer to better understand the programmatic utility of having all data we collect available online in an open format and incorporating this into our systems for program management.

Search for NASA employees people.nasa.gov

A screenshot of a web form titled "Search for NASA employees" with the URL "people.nasa.gov". The form is set against a dark background with white text and input fields. It contains five labeled input fields: "First Name:", "Middle Initial:", "Last Name:", "Email:", and "Phone:". Below these fields is a "Submit" button.

NASA Enterprise Directory search is publicly available

This web application allows anybody to find contact information for NASA contractor and civil servant workforce.

There are additional sections in this NASA Open Government Plan, such as “*Office of Procurement and Open Government*,” “*Financial Data Transparency*,” “*NASA Education Activities*,” “*NASA’s Technology Transfer Activities*” and “*Access and Utilization of NASA Science Data*,” that list a number of datasets of high value as well as discusses ways they will release additional information. Finally, a selective list of high-value data publicly available can be found at www.nasa.gov/open/data.html.

How This Fits into Open Government

NASA’s participation in Data.gov expands the audience for the vast body of knowledge captured in nearly 100 years of U.S. aeronautics and space data. Computer software developers, using these data sources, can help many more people participate in the exploration of space and our Earth by helping to create new ways of looking at these datasets. Additionally, by releasing information about administrative and procedural information within NASA, researchers and analysts can understand more about the inner-workings of NASA as well as allow our own employees to better understand other functions of our Agency.

Open Government Goals

- Three months
 - Release a Citizen Engagement Tool focused on soliciting ideas for NASA submissions for Data.gov.
 - Clarify strategy and process for submission of new datasets to Data.gov for NASA employees.
- Six months
 - Automate internal submission and review process for new datasets to Data.gov.
 - Assist in the creation of the *Access and Utilization of NASA Science Data* portal to access NASA’s science data available for download
 - Convene a workshop

10 Technology Partnership Web services

www.nasa.gov/offices/ipp/resources/databases.html



NASA Vehicle Assembly Building (VAB) at Kennedy Space Center is in the NASA Major Facility Inventory database

The Innovative Partnership Program has inventoried 10 useful web services for those interested to partner with NASA. The web services include NASA technologies available for free-use or licensing, a compilation of “spin-off” application of NASA technologies since 1976, NASA technology briefings, Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) abstracts, success stories, and finding innovations, and a Major Facility Inventory is a database of aerospace-related facilities and major associated equipment located at NASA field centers as well as installations from several other agencies.

with data stakeholders internal and external to NASA to discuss our data structure and processes for releasing data

- One year
 - Release five new high-value datasets or information holdings to Data.gov that have never been released to the public before based on public consultation with a Citizen Engagement Tool. Upon release, we will issue a rationale for why it is high-value.
 - Participate in *Access and Utilization of NASA Science Data* workshops
- Two years
 - Release an additional five new high-value datasets or information holdings to Data.gov that have never been released to the public before based on public consultation with a Citizen Engagement Tool. Upon release of each dataset or information holding, we will issue a rationale for why it is high-value.
 - Partner with Office of Chief Technologist and Participatory Exploration Office to provide content for partnerships and challenges.

Useful Links

1. NASA Geodata on Data.gov:
www.Data.gov/catalog/geodata/category/0/agency/183/filter//sort//page/1/count/1
2. NASA Catalogs and Tools on Data.gov:
www.Data.gov/catalog/tools/category/0/agency/49/filter//sort//page/1/count/25
3. NASA Raw Datasets on Data.gov:
www.Data.gov/catalog/raw/category/0/agency/49/filter//type//sort//page/1/count/25
4. Selected list of publicly available NASA data for download:
www.nasa.gov/open/data.html

Financial Data Transparency*From Transparency Breeds Accountability*

www.nasa.gov

☒ Transparency ☐ Participation ☒ Collaboration

The Office of the Chief Financial Officer, established in accordance with the Chief Financial Officers Act of 1990 (Public Law 101-576) (CFO Act), provides leadership for the planning, analysis, justification, control, and reporting of all Agency fiscal resources; oversees all financial management activities relating to the programs and operations of the Agency; leads the budgeting and execution phases of the planning, programming, budgeting, and execution process; and monitors and reports the financial execution of the Agency budget.

Transparency and Accountability are among the hallmarks of the many Federal Government Acts such as the CFO Act and the Government Performance and Results Act (GPRA) of 1993.

The CFO Act requires agencies to among other things ensure data integrity through independent audit. The Government Performance and Results Act of 1993 requires NASA to issue plans on how we will spend our budget and the results we intended to achieve. The NASA Authorization Act of 2005 required the agency to provide life cycle cost estimates for our largest programs, and provide annual updates to these estimates, through annual budget request to the Congress. This Budget request data has been made public since that time. And finally, the Federal Funding Accountability and Transparency Act (FFATA) of 2006 required NASA to publicly display e its awards. NASA has complied with these laws and continues to work to improve access to our financial data.

Recently, as required, NASA has ensured financial data transparency around the enacted American Reinvestment and Recovery Act of 2009. The implementation of the Recovery Act, builds on the foundation laid by GPRA, the NASA Authorization Act of 2005 and the FFATA, with the addition of direct reporting by the recipients to FederalReporting.gov.

Overview

Each year NASA develops and issues a plan to spend budgeted resources based upon intended objectives outlined by Congress and the President. This process starts with a strategic plan that sets the mission and outlines an Agency's goals, outcomes, and objectives for at least five years. Our annual performance plan then describes the performance indicators and program outputs needed to achieve their goals, outcomes, and objectives. In addition to financial data, we outline the long-term strategic goals, multi-year outcomes, and Annual Performance Goals (APGs) in the NASA Congressional Budget Justification and tracks progress toward these goals in the Performance and Accountability Report (PAR). This l report includes performance information and audited financial statements, as well as a view of management challenges, and plans to overcome them.

The NASA Authorization Act of 2005, Section 103: Baselines and Cost Controls, was enacted to assure better management of our major programs. This important legislation provided a basis for transparency to the public, of the full life cycle cost that a program

would require to achieve its goals. Per the legislation, a baseline report is provided in the next budget cycle once a program has been approved to begin development. This is applicable to any project with an estimated lifecycle cost greater than \$250M. The ensuing Major Program Annual Report (MPAR) is required with the yearly budget request, to provide an update to the baseline report with adjustments to key program information such as life cycle cost, milestones, and deliverables.

The Federal Funding Accountability and Transparency Act (FFATA) of 2006 requires information on Federal awards be made available to the public via a single, searchable Web site. The searchable Web site the government has created is USAspending.gov. The data is largely from two sources:

- The Federal Procurement Data System, which contains information about Federal contracts.
- The Federal Assistance Award Data System, which contains information about Federal financial assistance such as grants, loans, insurance, and direct subsidies.

The American Recovery and Reinvestment Act of 2009 (Recovery Act), was signed into law by President Obama on February 17, 2009. We are fully implementing the requirements for the Recovery Act, as provided by Congress, and providing the American public transparency and accountability. Recipients of Recovery Act funding are required to submit data quarterly for any grants, loans, and federally awarded contracts through Federalreporting.gov.

Currently, the annual NASA Congressional Budget Justification includes, the MPAR, the annual PAR and information on the agency's awards are publicly available. Collectively, these provide key financial information, and are found on the World Wide Web, as outlined below.

How This Fits into Open Government

Financial transparency and accountability efforts provide the public with information about how their tax dollars are spent. Collecting data about the various types of contracts, grants, loans, and other types of spending in our government will provide a broader picture of to the Federal spending processes. The ability to look at contracts, grants, loans, and other types of spending across many agencies, in greater detail, is a key ingredient to building public trust in government and credibility in the professionals who use these agreements.

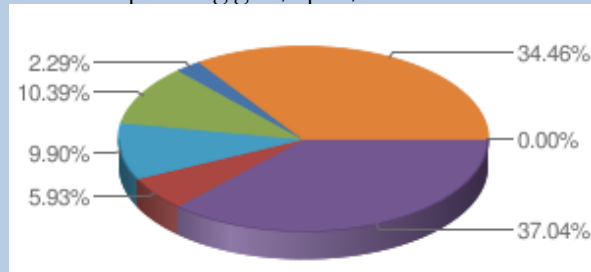


Open Government Goals

- Three months
 - Update the Recovery Act Program Plans to provide the public with the most current snapshot of NASA's activities to enact this initiative.
 - Publish the FY 2010 Annual Performance Plan Update to reflect changes to commitments due to budget actions.
 - Modify internal guidance and processes as necessary to incorporate recent and upcoming Office of Management and Budget (OMB) accountability and transparency requirements to further enhance Open Government.
 - Continue to work directly with OMB in modifying financial reporting models.
- Six months
 - Complete proposed FY 2011 Annual Performance Plan.
 - Utilize lessons-learned from NASA's implementation of the Recovery Act transparency elements in the development of the processes for Open.gov initiative.
- One year
 - Submit annual Performance and Accountability Report.
 - Deliver the Major Program Baseline and Annual Reports.
- Two years
 - Submit annual Performance and Accountability Report.

Fiscal Year 2009 Extent of Competition

www.usaspending.gov/fpds/



Example of USAspending.gov service, NASA's 2009 Extent of Competition

Total dollars: **\$14,867,479,006**

Total number of contractors: **4,140**

Total number of transactions: **31,134**

Available for everyone for competition	\$5,506,210,082
Everyone could compete, but only one bid or offer was received	\$881,384,217
Competition within a limited pool	\$1,471,861,649
Actions necessary to continue existing competitive contracts for continuity (until the next one could be competed)	\$1,544,086,236
Available only for groups such as disabled persons, prisoners, and regulated utilities	\$340,170,271
Not competed for an allowable reason	\$5,123,550,850
Not identified, soon to be addressed	\$215,700

Useful Links

1. Executive Office of the President Office of Management and Budget, Circular No. A-11-Preparation, Submission and Execution of the Budget:
www.whitehouse.gov/omb/circulars/a11/current_year/s200.pdf
2. NASA Annual Budget Request and Performance and Accountability Reports:
<http://www.nasa.gov/news/budget/index.html>
3. Guidance on Data Submission under the Federal Funding Accountability and Transparency Act (FFATA):
www.whitehouse.gov/omb/assets/memoranda_fy2009/m09-19.pdf
4. NASA's Award Information on the web: usaspending.gov/
5. NASA Acquisition Internet Service (NAIS): <http://prod.nais.nasa.gov/>
6. Overview of the NASA's Implementation of the American Recovery and Reinvestment Act of 2009 (Recovery Act): www.nasa.gov/recovery/index.html
7. Federal-wide Information on the Implementation of the Recovery Act:
www.recovery.gov/
8. Recovery Act Funded Recipient Reporting: www.federalreporting.gov

Access and Utilization of NASA Science Data

Stewardship for the Integrity and Preservation of Science Data as a Worldwide Resource

nasascience.nasa.gov

☒ Transparency ☒ Participation ☒ Collaboration

NASA has a strong track record of archiving and providing universal access to science data products from its science missions and programs. We will build on this tradition to enhance the quality, accessibility, and usability of NASA's science data holdings for scientists, educators, and the general public. We will continue to engage the community to evolve the science data environment with advanced capabilities and enhanced services through open solicitations and calls for participation. To the maximum practicable extent, we will collaborate with other Federal Agencies and the private sector to blend innovative efforts and emerging technologies toward a seamless national information infrastructure.

Overview

As a matter of longstanding policy and practice, NASA archives all science mission data products to ensure long-term usability and to promote wide-spread usage by scientists, educators, decision-makers, and the general public. Our vision is to facilitate the on-going scientific discovery process and inspire the public through the body of knowledge captured in these public archives. The archives are primarily organized by science discipline or theme. Communities of practice within these disciplines and themes are actively engaged in the planning and development of archival capabilities to ensure responsiveness and timely delivery of data to the public from the science missions.

The Planetary Data System (PDS) originally developed in the 1990s provides access to data from more than 50 years of planetary science missions via distributed topical nodes at seven research institutions. Astrophysics science archives have been established in a wavelength-specific structure alongside the Astrophysics Great Observatories, which include the Hubble Space Telescope, the Chandra X-Ray Telescope, and the Spitzer

NASA 3D Sun

3dsun.org/



NASA 3D Sun iPhone application

This iPhone application delivers a live global view of the Sun directly to your cell phone. A major solar flare erupts on the Sun. Before long, your phone chirps in your pocket to let you know! On the screen, you see a three-dimensional view of the Sun—a digital reconstruction of real-time satellite images freshly downloaded from NASA's twin STEREO spacecraft, orbiting millions of miles away from locations ahead and behind Earth.

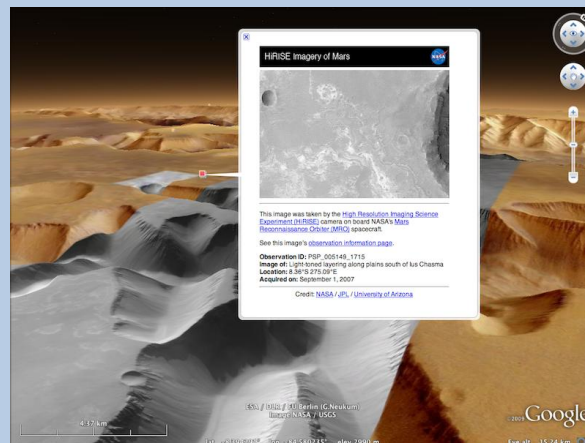
Infrared Space Telescope. The astrophysics data centers in turn have formed the foundation pieces for the Virtual Astronomical Observatory, or the seamless view of the digital sky in all wavelengths. The evolving Heliophysics Data Environment provides access to data and physics-based models that facilitate a systems level understanding of the Sun and its impact on our solar system.

Perhaps the most notable endeavor in this regard is the Earth Observing System Data and Information System (EOSDIS), which processes, archives, and distributes data from a large number of Earth observing satellites and represents a crucial capability for studying the Earth system from space and improving prediction of Earth system change. EOSDIS consists of a set of processing facilities and data centers distributed across the United States that serve hundreds of thousands of users around the world.

We promote broader utilization of our science data archives beyond the original investigators by increasing awareness of and ease of access through Web services and applications programming interfaces (APIs). The Earth Observing System Clearinghouse (ECHO www.echo.nasa.gov) is one such effort to promote broader use of Earth science data. ECHO is a spatial and temporal metadata registry that allows users to more efficiently search and access data and services and increases the potential for interoperability with new tools and services. We also have an extensive set of education and public outreach efforts that build on the science data archives to engage and excite students and the general public to use the data in citizen science endeavors. The “My NASA Data” site is one such effort to mentor teachers and amateurs in using atmospheric and Earth science data. (mynasadata.larc.nasa.gov)

Mars and Moon in Google Earth 5.0

earth.google.com/mars
earth.google.com/moon



Screenshot of Google Mars showing data from the HiRISE camera on Mars Reconnaissance Orbiter

NASA can reach vast audiences by leveraging freely available and widely adopted “geo-browser” tools using open standards like Keyhole Markup Language (KML). This is how data was prepared for the three-dimensional Moon, Mars, and Sky modes that are available as part of the Google Earth 5 software. These modes, developed under a partnership between NASA and Google, feature many of NASA’s high value data sets and provide a rich, immersive 3D view of the cosmos. Google Moon, Mars, and Sky aid public understanding of planetary science and astronomy and provide researchers with a platform for sharing data using the same open standards. Most importantly, it allows members of the public to participate by sharing their own content on top of NASA’s built-in data layers in a visually stunning and intuitive way.

Finally, we support ever-increasing public participation by providing science datasets in software applications on the Web, mobile phones, and other personal devices. These applications include desktop geographical-browsers such as Google Earth and World Wide Telescope (WWT) and Web applications like Galaxy Zoo. WWT is a rich visualization environment that functions as a virtual telescope, allowing anyone to make use of professional astronomical data to explore and understand the universe. Galaxy Zoo is very effective “crowd-sourcing” effort that has significantly enhanced the use of the science datasets. These platforms collectively reach millions of users worldwide, and provide exciting new capabilities for browsing data sets and soliciting broad public participation in science data analysis on a scale that has not previously been possible.

How This Fits into Open Government

Our science programs are predicated on the fundamental Open Government tenets of openness, transparency, and collaboration. We share the excitement of science with the public and engage them as virtual participants in our missions. There is a rich legacy of virtual participation via the Internet, including the “Encounter for Every Person” in 1996 that allowed people from around the world to download near real-time Hubble Space Telescope images when Comet Shoemaker-Levy collided with Jupiter. Images from the Mars Pathfinder mission, along with those from the Mars Rovers and the Mars Reconnaissance Orbiter, have engaged and excited people around the world in virtual exploration of the solar system. We will continue to evolve the science information infrastructure to build on this legacy and enhance and extend our public engagement. NASA also has extensive education and public outreach efforts that build on the science data archives to engage and excite students and the general public to use the data in citizen science endeavors. The My NASA Data site is one such effort to mentor teachers and amateurs in using atmospheric and Earth science data.

Open Government Goals

- Three months
 - Develop strategy and approach to interface more efficiently and effectively with the Federal Data.gov endeavor.
- Six months
 - Create a portal with access to all available science data from NASA Science Web site.
 - Identify opportunities across science data archive groups for enhancing connections and collaborations, both inside and outside NASA.
- One year
 - Convene one or more workshops involving NASA data archive specialists and stakeholders inside and outside NASA to explore opportunities for improving access to science data and engaging new audiences in the utilization.
- Two years
 - Partner with missions, Office of Chief Technologist, Participatory Exploration Office to provide content for partnerships and challenges that could use NASA science data as featured datasets.

Useful Links

- System (EOSDIS): eosdis.gsfc.nasa.gov
- Planetary Data System (PDS): pds.jpl.nasa.gov
- High Energy Astrophysics Science Archive Center: heasarch.gsfc.nasa.gov
- Multimission Archive at Hubble Space Telescope Science Institute: archive.stsci.edu
- Heliophysics Data Environment: lwsde.gsfc.nasa.gov

NASA Office of the Chief Information Officer

Reshaping the Future with Focused Visioning

www.nasa.gov/offices/ocio/home/index.html

☒ Transparency ☐ Participation ☒ Collaboration

The mission of the NASA Office of the Chief Information Officer (OCIO) is to:

- Provide our workforce the information infrastructure and tools that adapt and evolve to support management, science, research, and technology programs
- Develop and implement unique and specialized IT systems to support mission planning and operations
- Provide systems that disseminate information to the public and that preserve NASA's information assets.

The information technology tools we use to conduct our business sets the behavior of how we collaborate internally and externally and determines the ease with which we can release information publicly. While the OCIO aligns to deliver these services today in a safe, efficient manner, we are setting our sites on tomorrow.

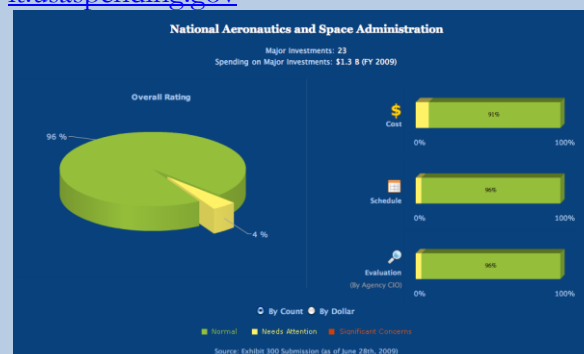
Overview

NASA Chief Information Officer (CIO) recently said to an open forum of NASA Center CIOs, "Why are we talking so much about 'right-now' technology instead of envisioning future technologies?" The business of Federal IT management typically takes shape through an annual budget exercise and legislated requirements articulated in OMB Circular A-130. To some degree the future is already the past by the time the Capital Planning and Investment Control (CPIC) process is completed and work begins on systems and applications.

Congressional legislation has prescribed the use of enterprise architecture to envision the future and provide a roadmap for sound investment decisions. The logic was to set out acceptable standards that contributed to future models so proposed procurements could be weighed against that model. Those that did not meet the standards were not part of the IT investment. The subtle trap in this kind of logical, practical approach is that senior leadership ends up spending most of their time justifying or managing the process of acquiring and implementing current technology solutions to increase the speed and improve performance of

NASA and IT Dashboard

it.usaspending.gov



NASA's IT spending score on IT Dashboard

NASA spent \$1.3B on 23 major investments for IT in Fiscal Year 2009 with 96 percent of our investments with a "green" score.

current business processes. Instead, a balanced approach should be taken between today's immediate needs and tomorrow's future vision, environment, and conditions that will dictate today's technology investments and pilot projects.

The E-Government Act of 2002 (Public Law 107 – 347) describes several goals for the government, which are in line with Open Government principles, such as increase opportunities for citizen participation, promote interagency collaboration, improve efficiency and effectiveness, reduce costs, promote better informed decision making, promote access to high quality information and make the government more transparent and accountable. NASA has actively participated and complied with eGov activities including being an active Partner Agency of the eRulemaking Program. NASA's leadership in Identity, Credential, and Access Management (ICAM) will also support Open Government initiatives by allowing partners (both within and outside of the Federal government) to access to our systems and facilitate collaboration without compromising security.

As we set our sights on the needs of tomorrow, we must recognize how the rapid growth of the Internet has changed how we use computers, access information, and collaborate. With mobile devices accessing the Internet expected to surpass one billion by 2013, the definition of a "computer" is changing with actual "computing" being done in clouds. Mobile devices, or platforms, will be less about computing and more about speed of access and usability.

The NASA Office of the CIO established the Chief Technology Officer for Information Technology (CIO- IT) position and will incorporate the Chief Technology Officers from each of the ten NASA Centers into a Chief Technology for IT Officer's Council. The charter for this council will be to look at the future predictions, new innovations, and creative ideas and formulate predictions for the future IT environment. The CIO- IT will explore pilot projects, such as the NASA Nebula Cloud Computing Platform and Semantic Search, as well as ways to decrease the environmental footprint of our IT infrastructure.

The Next Paperwork Reduction Act?

www.archives.gov/federal-register/laws/paperwork-reduction

The image shows Form 11-C, Occupational Tax and Registration Return for Wagering. It is a detailed form with multiple sections for reporting wages, taxes, and registration fees. The form includes fields for the taxpayer's name, address, and contact information, as well as sections for reporting wages from various sources, including federal, state, and local governments. It also includes a section for reporting registration fees and a section for reporting taxes. The form is designed to be filled out by the taxpayer or their representative.

Adopting new technologies to remedy pressing problems of the past.

Paper reduction and the resulting Paper Reduction Act were focused on reducing paper based forms and applications that the public was required to complete in order to receive service from the government. The future vision would move functions to the Web. The public would then access services more directly by inputting data via Web-based tools. Correlating data collections will increase the speed of the request and delivery process.

How This Fits into Open Government

NASA's Open Government Framework gives a perspective on the interplay between policy, technology, adoption of the technology and interpretation of the policy or culture. The NASA Office of the Chief Information Officer is a nexus of these three tenets of Open Government. The future vision of a single Agency is much more effective if it is shared in part or in total by another Agency or the public. When NASA begins to engage the public to better understand the future state of IT within NASA, the public can directly participate and contribute to fulfillment of that vision. Additionally, this transition for NASA is the same for other government agencies and large organizations. Many partnership opportunities exist to experiment with pilot projects.

Open Government Goals

- Three Months
 - Establish the Chief Technology Officer for IT position.
 - Establish the Chief Technology for IT Officer's Council.
- Six Months
 - Convene the First NASA IT Summit in August 2010 to convene approximately 600 of NASA's IT community as well as partners in the private sector.
 - Establish the "itfuturestate Web site as a "visioning one stop" for public and private participation in creation and comment on future visions for IT within NASA. It should contain drivers (e.g., policies, guidelines, process documents, project links), and game playing that allows for free exchange of ideas.
 - Begin a pilot project with a public-private-partnership within NASA to begin "future testing" (smaller devices accessing applications and data remotely to perform all mission functions).
 - Propose cross-Agency visioning subcommittee under Federal CIO Council.
- One Year
 - Post results of pilot project to Web for review and comment.
 - Produce first future state document.
- Two Years
 - Hold future IT Summit to discuss Agency-wide and interagency predictions.

Useful Links

1. NASA on IT Dashboard: it.usaspending.gov
2. NASA IT Infrastructure Integration Program (I3P) Acquisitions: i3p-acq.ksc.nasa.gov/i3p/default.cfm
3. NASA CIO Summit (internal NASA):
www.nasa.gov/offices/ocio/itsummit/index.html
4. NASA IT Security: www.nasa.gov/offices/ocio/itsecurity/index.html
5. NASA CIO Organization Chart:
www.nasa.gov/offices/ocio/organization/index.html

Open Innovation Projects

NASA Challenges Through Open Innovation

slsd.jsc.nasa.gov/

☒ Transparency ☒ Participation ☒ Collaboration

The NASA Open Innovation projects develop challenges that seek innovative solutions to research and technology problems that impact human health and performance in short and long duration human spaceflight. The challenges are offered through organizations (InnoCentive and Yet2.com) to a national and international community of potential solvers. A third pilot project was established with TopCoder and Harvard Business School to evaluate an open source code competition. These are pilot projects to determine the effectiveness of open innovation in solving NASA research and technology problems.

Overview

The NASA Space Life Sciences developed a strategy in 2007 to pursue external alliances to establish a balanced portfolio of research and technology solutions for human health and performance during human space flight. We sought expertise from academia in mapping research and technology needs or gaps to the best possible collaborative strategy. One strategy that clearly emerged was the use of open innovation service providers to seek solutions to challenges external to NASA.

Open innovation was defined by Henry Chesbrough, a professor and executive director at the Center for Open Innovation at UC Berkeley, as “a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology.” This open innovation strategy requires NASA to refine problems in the research and technology portfolio into challenge statements that can be addressed by a wide variety of disciplines and technical expertise external to NASA. In this way, NASA seeks to obtain innovative technology, research, service, and software code solutions through the extended community. Each pilot project has a different means of seeking and rewarding winning solutions.

NASA Innovation Pavilion on InnoCentive
<https://gw.innocentive.com/ar/challengePavilion/index?pavilionName=NASA>



NASA partnered with InnoCentive, Inc. to provide the public with the opportunity to solve difficult problems facing the U.S. space program in human health and performance. Solutions to the challenges on the NASA Innovation Pavilion will not only benefit space exploration, but may also further the development of commercial products and services in other industries. The first three challenges posted for one of the pilot projects have attracted more than 1,100 potential solvers across 64 countries. These challenges are currently undergoing evaluation for possible winning solutions. As an example, the challenge for a compact exercise device drew over 100 submissions that are undergoing evaluation.

We have created the NASA Innovation Pavilion on the InnoCentive open innovation platform, which, to date, has had four challenges (three from Johnson Space Center and one from Langley Research Center). In 2009, we developed an open source competition on the TopCoder community resulting in the writing of 3,500 lines of code and drew more than 1,800 entrants for the posted NASA challenge. These results are currently undergoing evaluation.

Later in 2010, we will have completed the pilot projects and will have recommendations for the further use of open innovation challenges to solve research and technology problems for NASA. These recommendations will evaluate the yield of solutions obtained versus the costs of using these open innovation tools (costs may include the actual service cost, time for personnel to be engaged in the process, training time, etc). These recommendations could then include useful metrics for the further use and evaluation of these tools. Potential solutions are provided to the government through open innovation service providers using a variety of business models, but all cost much less than traditional methods of seeking research and technology solutions. A second value to this approach is the rapid development, posting and solution time of weeks for finding potential solutions, instead of months or years required using more traditional means.

How This Fits into Open Government

In order to use open innovation pilot projects, NASA must be transparent in articulating a current challenge for human spaceflight and other challenges facing NASA. These models are inherently participatory as large and diverse communities of solvers around the world may pose a potential solution to a challenge. Depending on the type of pilot project, solvers may collaborate on a solution or establish a partnership with NASA to develop the proposed deliverable. These pilot projects greatly diversify the number of potential external collaborators for NASA.

Open Government Goals

- Three Months
 - Identify second round of challenges for two of the pilot projects and lessons learned developed from the first round.
- Six Months
 - Execute additional challenges both internal to NASA and externally based on the results of the first pilot projects.
- One Year
 - Develop a contract mechanism to permit open innovation models to be used by all NASA centers across a wide variety of challenges and disciplines.
 - Develop a “how to” guide for the future use of open innovation models within government.
- Two Years
 - Establish open innovation services as a mechanism for problem solving within NASA.

- Develop a “system of innovation” that will determine the best application of existing and new tools to solving NASA problems. This system could be captured in contracts, processes, or policy in the future.

Useful Links

1. Space and Life Sciences Directorate at Johnson Space Center: slds.jsc.nasa.gov/
2. NASA Innovation Pavilion on InnoCentive:
gw.innocentive.com/ar/challengePavilion/index?pavilionName=NASA
3. Yet2: www.yet2.com/app/about/home
4. NASA Coding Challenge on Top Coder: www.topcoder.com/nasacontest
5. Innovation in Large Organizations: www.iloinstitute.org

Flagship Initiatives

The flagship initiatives that NASA is undertaking promise to be some of the most exciting and innovative projects the Agency has developed. They have the ability to radically change the way we do things—from involving the public in software development to having student-designed payloads on missions to Pluto and beyond. These initiatives are not easy to implement. They go against the grain of how government traditionally operates, yet the challenges faced while implementing them give us valuable information on how to improve our internal processes and methodologies as we work towards changing the way we operate.



NASA Open Source Software Development

Improve the Quality, Impact, and Reuse of NASA Software through Open Source Development

opensource.arc.nasa.gov

☒ Transparency ☒ Participation ☒ Collaboration

Open source development—which allows free access to software source code to allow anyone to make improvements—is revolutionizing the way software is created, improved, and used. The open source software movement is inherently transparent, participatory, and collaborative. Open source at NASA gives the public direct and ongoing access to NASA technology. Its adoption by NASA also helps lower the barrier to entry into space by enabling private industry to better make use of NASA investments. Although open source release has already provided numerous benefits to NASA and the public, the full benefits of open source can only be achieved when we establish the processes, policies, and corporate culture to favor open source development. This would shift our open source activities from its one-way direction of giving the public access to finalized software products, to allowing two-way collaboration as part of the development process. The benefits of allowing the public to assist in development of NASA software include increased software quality, accelerated software development, and a higher rate of technology transfer both to and from NASA.

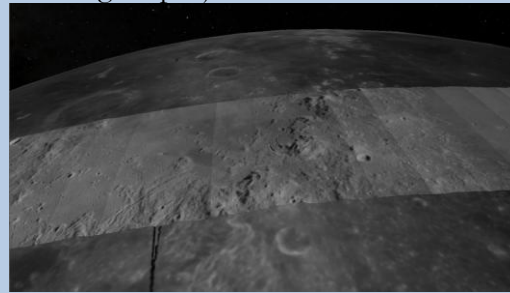
Overview

The rapid growth of the Internet has changed how we use computers. For software developers this has led to new forms of collaboration and code reuse. Perhaps the most exciting development has been the growth of open source software. Open source involves the joint production, release, and distribution of software that is freely and widely available. The number of open source projects and amount of open source code is growing at an exponential rate and in some cases, allows work created for one project to be applied to another.

NASA has used open source to address project and mission needs, to accelerate software development, and to maximize public awareness and impact of our research. The NASA Open Source Agreement (NOSA) is an Open Source Initiative (OSI) approved license to allow public release of NASA-funded software. Since 2003, we have released more than 60 software projects under the NOSA. Part of NASA's charter (Space Act of 1958) is to "provide for

NASA Vision Workbench

ti.arc.nasa.gov/project/nasa-vision-workbench



3D terrain model of the Apollo 15 site created with Vision Workbench

The NASA Vision Workbench is a general purpose image processing and computer vision library under development by the NASA Ames Intelligent Systems Division. Vision Workbench has been available as NASA open source software since 2006 and has been used to create interactive explorable panoramas (gigapan.org) and produce high-resolution two- and three-dimensional maps of the Moon for robotic exploration. Vision Workbench is currently in use at NASA, Carnegie Mellon University, Google, and by computer vision researchers worldwide. During 2010, Vision Workbench will be used as a test case for incorporating third-party (non-NASA) source code contributions.

the widest practical and appropriate dissemination of information concerning its activities and the results thereof.” Open source directly addresses this by facilitating rapid and wide dissemination of software with minimal overhead and cost.

To date, NASA’s use of open source has focused on two types of software release:

- 1) Point release, which is infrequent release of completed software (subject to NPR 2210.1A).
- 2) Continuous release, which is on-going, frequent release of software under development within well-defined bounds and periodic review (subject to NPR 2210.1A).

Recently, however, we have created the NASA Contributor License Agreement (CLA). The CLA allows code from third-parties to be incorporated for future release under NOSA. Moreover, we are starting to distribute released code via popular software forums (e.g., SourceForge), which makes NASA software more readily accessible to open-source developers. Finally, we are developing the capability to host source-code on NASA and public servers for software under development.

Although NASA and the public have already derived numerous benefits from open source release, the full benefits of open source can only be achieved if we establish the processes, policies, and corporate culture for open source development. In short, this means providing a path for non-NASA developers to contribute to on-going NASA projects in real-time. With recent innovations, such as continuous release and the CLA, NASA is ready to adopt policies and the processes needed to support such development.

NASA World Wind worldwind.arc.nasa.gov



NASA World Wind is a 3D “virtual globe” that has been released open source

World Wind is an open source “virtual globe” that allows users to explore different planets in 3D. World Wind overlays NASA and USGS satellite imagery, aerial photography, topographic maps, and publicly available GIS data on 3D models of the Earth and other planets. Many people using World Wind are adding their own data or expanding the functionality by using “add-ons” and making them available through various sources, such as World Wind Central (worldwindcentral.com). World Wind is publicly available via the SourceForge open source hosting site.

Evolving Policy

- 2003 – Creation of the NASA Open Source Agreement (NOSA)
- 2008 – Continuous release authority
- 2009 – Contribution License Agreement (for individuals and companies) for NOSA projects
- 2010 – Source Forge modified Terms of Service for NOSA software distribution

How This Fits into Open Government

Open source development makes NASA more transparent by enabling the public to better understand what types of software NASA needs to fulfill its mission. The public can directly see how NASA software is designed, implemented, and improved. Open source development makes NASA more participatory by allowing the public to assist in NASA software development. Students, scientists, and programmers can directly contribute their expertise, skills, and work to NASA projects and missions. Open source development makes NASA more collaborative by providing an efficient and effective means to transfer software to, and from, NASA. This results in higher quality software and increased reuse of software for other purposes.

Open Government Goals

- Three Months
 - Obtain approval to use multiple public, open source development sites (e.g., SourceForge, GitHub) for hosting NASA open source software releases.
 - Establish tools to facilitate NASA open source release process (e.g., database of third-party libraries cleared for use by NASA software).
- Six Months
 - Establish opensource.nasa.gov Web site as a “one-stop shop” for NASA open source (e.g., policies, guidelines, process documents, project links), which will serve NASA developers, NASA software release authorities, and the public.
 - Implement all-electronic processes for handling third-party contributions (including electronic signature of contributor license agreement).
- One Year
 - Implement streamlined review process for NASA open source release (both point and continuous), which reduces approval time to two to four weeks.
- Two Years
 - Establish processes for NASA software projects to be open source from inception, including the use of community development and public source code hosting.

Useful Links

1. The NASA Open Source Agreement (NOSA): opensource.arc.nasa.gov/page/nosa-software-agreement
2. Ames Research Center Open Source Agreement: opensource.arc.nasa.gov
3. Goddard Space Flight Center Open Source Agreement: opensource.gsfc.nasa.gov
4. NASA COSMIC Collection: www.openchannelfoundation.org/cosmic
5. Open Source Initiative: www.opensource.org

NASA Nebula Cloud Computing Platform*Cloud Computing for a Universe of Data*

nebula.nasa.gov

☒ Transparency ☒ Participation ☒ Collaboration

Nebula is an open-source cloud computing platform that was developed to provide an easily quantifiable and improved alternative to building additional expensive data centers and to provide an easier way for NASA scientists and researchers to share large, complex data sets with external partners and the public. Nebula is currently an Infrastructure-as-a-Service (IaaS) implementation that provides scalable compute and storage for science data and Web-based applications. Nebula IaaS allows customers to unilaterally provision, manage, and decommission computing capabilities (virtual machine instances, storage, etc.) on an as-needed basis through a Web interface or a set of command-line tools. Platform-as-a-Service (PaaS), scheduled for release in Q4 2010, will provide a consistent set of frameworks, code repositories, and Web services to enable NASA developers to deploy secure, policy-compliant Web applications that automatically scale to meet variable demand. Software-as-a-Service (SaaS) and Database-as-a-Service (DBaaS) are planned for 2011.

Overview

Nebula emerged in 2008 out of NASA Ames Research Center. Nebula allows NASA to realize significant cost savings through better resource utilization, reduced energy consumption, and by reducing the labor required to procure infrastructure or create new Web applications. Many of NASA's dedicated compute and storage servers are underutilized but still require expensive environmental controls and a high level of on-going energy investment. Nebula allows NASA scientists to pool IT resources, only using what services they need for the time period they need it, and enabling those resources to be used by others when they no longer need them.

Nebula's high-density architecture allows for a dramatically reduced data center footprint. Each shipping container data center can hold up to 15,000 CPU cores or 15 petabytes (one petabyte equals one million gigabytes), proving 50 percent more energy efficient than traditional data centers. In addition, this "green" architecture allows for maximum flexibility and efficiency since these modular shipping container data centers can be modified, upgraded, expanded and even physically relocated as NASA's computing needs evolve over time.

In a traditional IT environment, it takes several months and usually hundreds of hours of labor by several different people to procure, set up, configure, and maintain new IT infrastructure. NASA must comply with a host of data security and privacy policies, which can sometimes create a challenge in finding a collaborative environment in which to share data with its outside partners. By utilizing Nebula, users gain access to powerful IT resources months faster



Nebula Container at NASA Ames Research Center

and with far less effort than before. Nebula saves hundreds of staff hours, allowing NASA scientists to focus on mission-critical activities instead of IT infrastructure requirements. Nebula's architecture is designed from the ground up for interoperability with commercial Cloud service providers such as Amazon Web Services, offering NASA researchers the ability to easily port data sets and code to run on commercial Clouds.

To facilitate the adoption of cloud computing within NASA and the Federal Government, Nebula team members serve on various Federal cloud working groups. Nebula's sponsor, Ames CIO Chris C. Kemp, chairs the Federal Cloud Computing Standards Working Group and the two security specialists responsible for Nebula's IT Security Plan Certification and Accreditation (CandA) are active members of the Federal Cloud Computing Security Working Group. Nebula's participation with such groups will help both NASA and the Federal Government realize the many benefits of cloud computing on an accelerated timetable.

Nicknamed the "Super Cloud," Nebula can effortlessly manage 10,000 or 100,000 times the amount of information as the most powerful commercial cloud computing platforms, accommodating files as large as eight terabytes and accommodating an individual file system of 100 terabytes (one terabyte equals 1,000 gigabytes). By contrast, the maximum Amazon EC2 file size and file system size is one terabyte. Built upon a converged 10Gig-E switching fabric, Nebula delivers 10 times the networking speed of the fastest available commercial cloud environments, most of which run at 1GigE, and use only 100Mb. This combination of high-speed networking, 2.9GHz CPUs, and hardware RAID configurations allows the Nebula environment to provide massively parallel performance equivalent to the best dedicated hardware currently available, and far in excess of any commercial cloud.

Cloud computing is a significant departure from the traditional IT infrastructure model. It will require technical training as well as a shift in how our teams and programs think about IT resources. This shift will require us to change budgeting, procurement, workflow, and our approach toward processing, storing, and accessing data. As a mission-driven Agency that is reliant upon data, we will need to provide adequate education and training to employees and contractors for greater adoption.

How This Fits into Open Government

The NASA Open Government Framework states that agencies must address issues surrounding policy, tools, and culture if they want to successfully implement Open Government principles within their organization. Nebula is the key tool that will enable the easy flow of information between NASA and the public and is the cornerstone of this Open Government Plan.

NASA Nebula hosts USAspending.gov 2.0 www.usaspending.gov



USAspending.gov 2.0 is hosted on NASA Nebula

Nebula partnered with the General Services Administration (GSA) to host USAspending.gov 2.0.

Nebula IaaS makes it easier, faster, more secure and much less expensive to deliver data-driven Web sites that encourage public participation and collaboration. Nebula allows groups inside NASA to provision resources within minutes, avoiding the lengthy procurement, certification, and security processes required for new computing infrastructure.

NASA currently has more than 3,000 external-facing Web sites deployed on variety of different platforms. Nebula PaaS will help NASA create a more coherent Web experience for the public by allowing smaller projects and offices to use the same platform as the large programs and directorates. It will also provide NASA software engineers with a robust development environment and sophisticated set of tools that make it faster, easier, and much less expensive to deliver data-driven and scalable Web sites that encourage public participation and collaboration.

Nebula opens the doors to crowd sourcing and collaboration with powerful, economical computing resources that are built for government. The flexible capability that Nebula offers hastens the pace of innovation, collaboration, and new breakthroughs in a way that we see every day in the private sector. By working with the open source community and operating in a fully transparent manner, Nebula continues to build upon NASA's heritage of forging new ground and sharing its results with other government Agencies.

Open Government Goals

- Three months
 - Complete plans to incorporate Nebula into NASA's data center strategy or IT framework as determined by the OCIO.
 - Continue testing Nebula IaaS alpha performance by supporting at least forty internal NASA projects.
 - Release Nebula IaaS beta.
 - Have a Nebula PaaS prototype by July 2010.
- Six months
 - Complete Nebula's IaaS 1.0

NASA and Microsoft's World Wide Telescope

www.microsoft.com/presspass/press/2009/mar09/03-24NASADDataPR.msp



WorldWide Telescope's access to NASA's Mars Data stored on NASA Nebula

Through a Space Act Agreement, NASA computer scientists are working with Microsoft engineers to make NASA's data accessible through Microsoft's World Wide Telescope platform. NASA Nebula processed and hosted more than 100 terabytes of data for this project, completing what would have taken at least four to five months in just three days.

- Release Nebula PaaS alpha by the end of 2010.
 - Release first package of open source contributions.
 - Increase Nebula compute and storage capacity.
- One year
 - Release Nebula PaaS beta.
 - Complete Nebula PaaS 1.0.
 - Complete Nebula IaaS 2.0.
 - Release second package of open source contributions.
 - Increase Nebula compute and storage capacity.
- Two years
 - Deploy the entire Nebula baseline suite of services (IaaS, PaaS, DBaaS and SaaS) into full production operation.
 - Enhance and augment Nebula services and capacity as part of normal lifecycle management.
 - Release additional open source contribution packages.

Useful Links

1. NASA Nebula: nebula.nasa.gov/about
2. Article from *Federal Computer Week*: fcw.com/articles/2009/12/10/open-government-cloud-computing.aspx?sc_lang=en
3. Article from *Government Computing News*: gcn.com/articles/2010/02/15/nasa-nebula-sidebar.aspx
4. Article from Govfresh.tv: govfresh.com/2010/02/nasa-nebula-sends-government-to-the-cloud/
5. Article from *Government Technology*: www.govtech.com/gt/717731

Participatory Exploration Office*Public Participation in Aeronautics Research and Space Exploration*

www.nasa.gov

☒ Transparency ☒ Participation ☒ Collaboration

“Participatory exploration” is the active involvement of individuals as contributors to and collaborators in NASA’s research, science, and exploration activities. Participatory Exploration embodies far more than simply exposing people to or educating them about NASA’s discoveries and exploration activities. It encourages individuals to contribute their creativity and capabilities to NASA’s mission of discovery and invites them to share in the excitement of building our future. The FY 2011 President’s budget proposes that NASA will create a Participatory Exploration Office to support research on new technologies to increase public participation, coordinate NASA-wide efforts to incorporate new participatory exploration approaches into future work, and act as a clearinghouse for identifying and communicating best practices both internally to NASA and externally to our communities.

Overview

A key requirement included in the Space Act is for NASA to act as an engine of innovation and to widely disseminate its knowledge and technologies. We sponsor hundreds of programs, activities, events, and resources, including award-winning Web sites, collaborations with museums and science centers, strategic partnerships, and research projects that allow the public to learn about, and in some cases, participate in our missions. We have been successful in developing, implementing, and sustaining quality education and outreach programs.

Our employees continuously experiment with new technologies and methodologies to engage the public in our mission to feel like they are a part of space exploration. Over the years, various projects have embraced crowd sourcing tools and methodologies to allow people to contribute in meaningful ways to our projects. This has evolved into a new way for the interested and talented public to go beyond being simply recipients of public outreach information and experiences and to become part of our missions without being a NASA employee or on a funded science team. By increasing the ways in which the public can directly and specifically contribute to NASA missions, NASA can bring additional creativity and capability to some of our biggest challenges. We call this concept “participatory exploration.”

In 2007, NASA recognized how access to information and collaborative behavior online was changing business and the very nature of how people interact and work. A day-long Participatory Exploration Summit convened NASA employees and leading thinkers outside NASA to explore ways to apply this thinking to NASA’s mission. We formed an informal community within NASA and began collaborating over social media and at conferences to promote greater adoption of participatory exploration within NASA’s missions. The concept began to spread, and many education and outreach initiatives have embraced participatory elements in their programs. A Web site, www.nasa.gov/connect was created to access participatory projects through the Agency.

In the 2008 NASA Authorization Act (released in 2009), Congress directed NASA to develop a Participatory Exploration Plan, calling for NASA to “develop a technology plan to

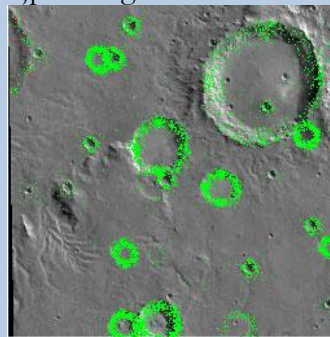
enable dissemination of information to the public to allow the public to experience missions.” The FY 2011 Budget calls for NASA to “establish a Participatory Exploration Office, funded at \$5 million a year, with the goal of making NASA missions more participatory and even more collaborative.”

A cadre of passionate personnel from across NASA has formed to plan and structure the Participatory Exploration Office. The Office will support research on new technologies that can increase public participation, coordinate NASA-wide efforts to incorporate new participatory exploration approaches into future work, and act as a clearinghouse for identifying and communicating best practices both internally to NASA and externally to our communities. The activities the Office supports and coordinates will help empower citizens to become not just consumers of NASA innovation but co-creators of knowledge and ideas to advance space exploration.

The Office will play a key role in helping our programs explore multiple approaches to Participatory Exploration, including crowd sourcing and open innovation models. This should enable us to conduct our activities more efficiently while advocating for appropriate participatory exploration activities. By having a view across the entire Agency, the Office will be able to evaluate new and existing approaches and will be able to assist programs in determining the how they could incorporate participatory exploration opportunities. The effective implementation of this approach will result in a tool set and capabilities that can be used across mission activities. The Office will issue guidance and will develop policies to encourage participatory exploration activities across NASA. We will evaluate different strategies and methodologies to achieve

Clickworkers and Be A Martian

beamartian.jpl.nasa.gov



Pixels indicate Clickworker's identified craters

In 2000, NASA scientists created a small experimental project that uses public volunteers (nicknamed "clickworkers") for scientific tasks that require human perception and common sense but not a lot of scientific training. Originally used to count craters on celestial bodies, this technique crowd sources tasks to many people and statistical corrections aggregate the input into a format of scientific utility for researchers. The Clickworkers underlying technology has been used for crowd sourcing geological features on celestial bodies shown in the data received from Mars Global Surveyor, Dawn, and Mars Reconnaissance Orbiter (MRO) Hi-RISE camera.

In 2009, NASA partnered with Microsoft Corp. to create an experience for the public to participate as citizen scientists and experience Mars through improving maps, taking part in research tasks, and assisting Mars scientists by counting craters.

participatory exploration activities within our mission, internally partner with NASA programs to leverage their resources, and enter into cross-governmental and non-governmental partnerships. As the clearinghouse for such activities at NASA, the Office will measure and monitor progress, learn from pilot projects, and continue to refine models for strong partnerships with the public.

How This Fits into Open Government

The Participatory Exploration Office will serve as an internal resource to use appropriate technologies and methodologies to allow the public to participate in NASA's missions. In some cases it may be contributing to the creation of new missions, supporting engagement with existing missions and data, or to contributing innovative ideas and solutions to grand challenges. As more aeronautics research and space exploration missions are conducted with public participation, NASA envisions a greater return on science and technology investment. This in turn may free up more resources for additional research projects. Active engagement of the public may inspire today's scientists and engineers, as well as the next generation of explorers. It also reflects the increased relevancy of our activities to individuals.

One of our objectives in improving public participation is to encourage a broader segment of the population to become aware of and interested in the formal study and pursuit of a career in science, technology, engineering and math (STEM) as a method of promoting economic vitality. Additionally, giving individuals opportunities to participate in NASA missions gives them a first-hand look into the inner-workings of NASA.

The Office will actively collaborate, both internally and externally with other agencies, non-profit organizations, and corporations, to identify opportunities to work with or leverage

The New Horizons Student Dust Counter lasp.colorado.edu/sdc/



Flight hardware and testing equipment for the Student Dust Counter prior to assembly to New Horizons

The Student Dust Counter (SDC) was designed and built by University of Colorado students, and is aboard NASA's New Horizons spacecraft on its way to Pluto. SDC maps dust in the solar system to understand the density and variation of dust particles as the spacecraft travels across the solar system. SDC is a "secondary science payload" which is placed on the spacecraft as long as it doesn't interfere with achieving the primary mission objectives. Successfully integrated and launched along with New Horizons, the instrument is now operated by the students. SDC is part of the education and public outreach plan for the New Horizons mission and is an example of participatory exploration.

activities that they are fostering. Finally, the Office will focus on creating metrics and models which will help us to operate efficiently and effectively, and which may be beneficial to other government agencies.

Open Government Goals

- Three months
 - Develop and obtain approval for the Internal Participatory Exploration Office Plan.
- Six months
 - Begin benchmarking other efforts on crowd sourcing, segmenting the market, and engaging the public.
- One year
 - Use direct (workshops) and indirect (Web polls) methods to generate and gauge external interest in and information on participation.
 - Establish the Participatory Exploration Office and policies to ensure participatory exploration opportunities are a part of future missions.
 - Identify and implement opportunities to stimulate technology development and activities that support participatory exploration.
- Two years
 - Incorporate lessons learned from initial participation efforts. Ensure that technologies that can support participatory exploration are included in on-going missions.

Useful Links

1. 2007 Participatory Exploration Summit: colab.arc.nasa.gov/node/83
2. Moon Work Contest: moontasks.larc.nasa.gov/
3. List of Participatory Exploration Projects: www.nasa.gov/connect
4. Citizen Science Activities: nasascience.nasa.gov/citizen-scientists
5. Birth of a Star: gigapan.org/gigapans/24179/

Appendix

Citizen Engagement Analysis

Crowd-Sourcing Ideas for NASA's Future

opennnasa.ideascale.com

☒ Transparency ☒ Participation ☒ Collaboration

On February 5, 2010, the General Services Administration (GSA) launched a Citizen Engagement Tool based on the IdeaScale platform 22 federal agencies, including NASA. This platform allowed members of the public to submit, rank, and comment on ideas as to how NASA can best fulfill the goals of the Open Government Directive by becoming more transparent, participatory, collaborative, and innovative.

NASA assembled a group of NASA moderators to remotely work together to help shape the community. The first couple of weeks are crucial for emerging communities, as it sets the tone and behavior. We paid close attention and assisted ideas that were off topic to be reshaped and articulated to be more useful to Open Government. After a couple weeks, many people began to comment on other ideas and it became a community-moderated site. Once we were able to change the default landing page to 'most popular' we elected to not move off-topic ideas, as the community would vote them down.

For promotion, we issued web stories on www.nasa.gov, tweeted with the @NASA account, and alerted people to contribute from our Facebook page. Internally, we issued an Agency-wide e-mail to encourage our employees to contribute to the discussion. By March 19, when the period for collecting ideas closed, NASA had received the most traffic out of any Agency's site, with more than 453 ideas and 8,000 votes.

After the period for idea collection had ended, we began an extensive overview of the submitted ideas, classifying them into one of five categories:

- Things we can do
- Things we do or have done
- Things we cannot do
- Unclear
- Off-topic

NASA Citizen Engagement Stats (February 5 - March 19 2010)

453

Ideas

868

Comments

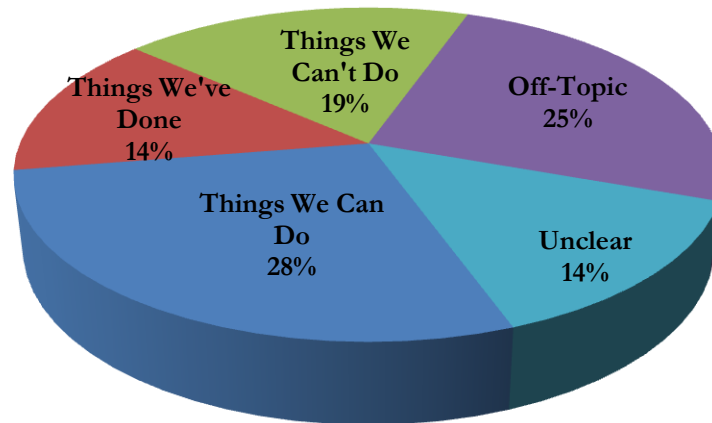
1,271

Total Users

8,097

Votes

Submitted Ideas to NASA's Citizen Engagement Website



The ideas received have directly made it into the process of the NASA Open Government Plan. We elected to highlight information in sections that were requested, such as open source software, technical reports database, university and student involvement, and many ideas to feed into the Participatory Exploration Office.

The following pages contain a review of the initial analysis done on the submitted ideas to the Web site, as well as steps moving forward to increase NASA's citizen engagement in the future. Some of the ideas submitted to the Web site during the open period have already been implemented or are in the steps of becoming reality, while others could become long-term goals for various efforts throughout the Agency.

Things We Can Do

The primary goal when reviewing the Citizen Engagement content was to identify action items that NASA can undertake to better allow the public to understand and partake in our activities. Of the 453 ideas submitted

NASA-Sponsored Barcamps

opennasa.ideascale.com/a/dtd/19269-7044



NASA sponsored the first ever SpaceUp barcamp in San Diego as a result of an idea and comments from the public

One of the earliest ideas received was for NASA to sponsor space-themed barcamps. A barcamp is a “user-generated” conference, where attendees decide the discussion topics and sessions based on their own interests. As the idea received votes, a commenter noted that the San Diego Space Society would soon be hosting “SpaceUp,” the first ever space-themed barcamp, in only two weeks. NASA contacted the organizer, became a sponsor, and sent representatives, thus becoming the first idea to be implemented.

to the site, 126, or 28 percent, were things that NASA could legally and feasibly address in either short-term or long-term plans.

As part of the process, these ideas were tagged to specific topic areas (such as education, public affairs, NASA spinoff, etc). In April 2010, relevant ideas will be delivered to the corresponding NASA office along with an explanation of the engagement process.

Things We Do and Have Done

Fourteen percent of the comments submitted contained ideas for things that NASA programs already accomplish. In their own regard, these ideas are extremely valuable as they are an excellent indicator of programs that need to be made more available to the public or otherwise have their public awareness heightened. Additionally, many of the comments, although focused on a program NASA already runs, contained additional ideas that can help improve those programs or otherwise broaden their audience. In April 2010, relevant ideas will be delivered to the corresponding NASA pre-existing program so they may use the information to better inform the public about their program and consider suggested improvements.

Things We Cannot Do

Nineteen percent of the submitted ideas contained suggestions that NASA could not feasibly introduce. In some cases, this was due to a regulatory issue that would prevent NASA, as a Federal Agency, from partaking in the activity. In other instances, the idea suggested that NASA do something in an area in which it has no authority or ability to do so.

In many of these circumstances, the NASA moderating team attempted to contact the individual who posted the idea in order to obtain additional feedback that could assist in transforming the idea into an actionable item in the Plan. This, however, was not possible in all cases.

Off-Topic or Unclear Ideas

A quarter of the ideas submitted to the site were classified as being either off-topic or unclear. In these instances, the submitted idea did not pertain to the objectives of the Open Government Initiative, or was illegible and unable to be classified. Many of these submitted ideas suggested technology development or technical advice for NASA missions. While many of these ideas contained intriguing advice, they were outside the purview of the Open Government Initiative. The excitement behind many of these ideas, however, has encouraged us to move forward with developing future crowd sourcing idea collection movements, with the hope that the ingenuity of the public can be used to help NASA scientists and engineers create new solutions to difficult challenges.

In circumstances where an idea was determined to be off-topic or unclear, the NASA moderator team attempted to contact the author of the idea in order to obtain additional feedback in the hopes of formulating the idea to better fit the goals of the Open Government Initiative. Initially, ideas that were tagged as being off-topic were moved to a separate Off-Topic forum on the site. As the community grew, however, the moderators decided to enable community members to self regulate, and many of the off-topic suggestions naturally moved to the bottom of the vote stack as on-topic ideas received more votes.

Lessons Learned

As with any pioneering project, the deployment of the Citizen Engagement tool did present some challenges. Shown by the percentage of off-topic responses, our largest challenge was to focus the discussion on relevant and implementable ideas. This can be address through a variety of ways, but most importantly is to have clear and narrow topic for people to present their ideas. This will allow people to be creative within the constraint identified out the office. In order to get to clearly identified constraints, the office or program seeking engagement should understand what they want to get out of it and identify resources to implement the ideas generated. This immediate feedback would then allow the community created to see the direct response to their efforts.

Some ideas were similar, and surprisingly, in more than one case were submitted by different NASA employees. By having an open dialogue, this has increased internal collaboration as some people were working independently on different solutions to a similar problem. Some of the ideas submitted to the site were infeasible or otherwise unpractical for NASA to address, yet received a high number of votes. Moving forward, it is important to establish a framework and procedures for strategically implementing ideas, including ways to work with idea authors when their submissions are, for various reasons, not able to be accomplished by the Agency.

Moving Forward

One of the most exciting developments of the open consultation is the possibility for future crowd-sourcing innovation. Over the next few months, NASA will be making IdeaScale sessions available Agency-wide, leveraging the GSA's hard work to make it possible for government agencies to use. This will enable various projects, offices, and programs to solicit ideas from the public in a standardized form at low cost to the Agency. We know that there are other tools publicly available and will be assessing their utility for NASA use. We also welcome inter-governmental collaboration to assist in adoption of a collaboration tool better geared toward government needs.

Open Government Goals

- Three Months

Educators Submit Ideas

< Back To OpenNASA

Deploy astronauts...to schools more often!

brandt

I Agree

8

I Disagree

Astronauts are currently assigned flights, etc. for a stated period...send 'mission crews' not currently in flight status to schools for missions of close collaboration with kids to motivate them to pursue STEM careers. Seeing a 'real astronaut' who has been in space is an unforgettable life-altering experience for most kids outside the Houston, TX area. Deploy astronaut teams for 3+ weeks to school districts/private school consortia all over the USA that can demonstrate how they will be used in the educational setting to deliver maximum 'Buck Rogers' for my taxpayer buck. One more thing-allow them to speak candidly about all sides of STEM.

idea # 226 | Working Together: Governments, Businesses, Non-Profits..., astronauts, education, stem

An Education Idea Submitted to IdeaScale

As part of NASA efforts to get a wide variety of input on the Citizen Engagement Tool, the NASA Office of Education sent out an email to its 18,000+ educator members inviting them to submit ideas on how NASA can better engage students and teachers in programs and activities. The Office of Education asked them seven specific questions and requested they 'tag' their response with the corresponding Education question. Dozens of teachers from across the country logged in and submitted ideas, which will be passed on to the Office of Education for further review and analysis in April 2010.

- Further review ideas and distribute to relevant offices throughout Agency for analysis and implementation.
- Deploy IdeaScale as Software as a Service for entire Agency, allowing multiple crowd-source discussions to take place on a variety of NASA-focused topics.
- Establish a How-To guide for offices to use citizen engagement for their programs
- Establish framework and procedures for handling un-implementable ideas with a high number of votes, including ways to work with idea authors to make their submissions more realistic or tenable.
- Participate in Inter-agency 'Ideation Community of Practice' working group
- Six Months
 - Evaluate effectiveness of implementation of user-generated ideas, work to streamline idea-gathering process.

Useful Links

1. Idea Scale: opennasa.ideascale.com
2. NASA's Open Government: www.nasa.gov/open

A Letter to Transparency Advocates*Compliance Matrix and Analysis*

Our goal with the Open Government Plan is to communicate our framework and Open Government principles to provide context toward how we embrace Open Government. We believe that this is a process and that it is the responsibility of each directorate, program, and employee to make NASA more open. We have elected to take a structured approach to describe our activities that make NASA open, participatory and collaborative to enable the reader to browse to topics of interest, easily learn new topics and understand how to get involved. We also did it this way for our workforce; by turning this Open Government Plan into a platform to communicate what we do and tell stories that exemplify participatory behavior, we hope there will be a positive response by the community. With positive feedback, the social reward will allow that behavior to be repeated.

While we took a structured programmatic approach to describe our processes, we want to ensure that we have complied, and exceeded, the requirements of the Open Government Directive. This appendix aims to break down the directive into individual set goals and identify where in the plan those goals are addressed. In ensuring our compliance with the Directive, we noticed that some of the requirements for the plan are satisfied multiple times throughout the document. In these cases, we identified the section we feel best fit the particular requirement.

As stated in our Framework and Goals section, this plan is a first step of an iterative, learning process. We want to work with you as this plan moves forward, both in ensuring our continued compliance with the Directive and in working towards furthering the principles of Open Government into the NASA culture and the very fabric of our government. We understand that a changing external environment alters behavior and that change can also happen from within. There are some things that we must do alone, and there are some things that you must do as well. But with select key initiatives, by working together, we can transform our government into a democracy for the information age. Thank you for the work you've done to make our government more transparent, participatory, and collaborative.

Section #1: Transparency

Objective	Relevant Sections in Plan
“Your agency’s Open Government Plan should explain in detail how your agency will improve transparency. It should describe steps the agency will take to conduct its work more openly and publish its information online, including any proposed changes to internal management and administrative policies to improve transparency.”	Principle #1 in the <i>Framework</i> section details NASA’s intent to improve transparency in its operations. The Open Government Goals in the fact sheets with a Transparency check-mark articulate how we will become more transparent.
“...your agency should describe how it is currently meeting its legal information dissemination obligations.”	The <i>Procurement, Public Affairs Web Initiatives, Financial Data Transparency</i> , and <i>OCIO Initiatives</i> sections describe how we are meeting our legal information obligations.
“A strategic action plan for transparency that (1) inventories agency high-value information currently available for download; (2) fosters the public’s use of this information to increase public knowledge and promote public scrutiny of agency services; and (3) identifies high value information not yet available and establishes a reasonable timeline for publication online in open formats with specific target dates. In cases where the agency provides public information maintained in electronic format, a plan for timely publication of the underlying data.”	The <i>Data.gov</i> section of the plan lays out a strategic plan for releasing high-value datasets in the future onto data.gov as well as provides examples of current datasets on the site.
	The sections on <i>Education Activities, NASA Engineering Network and NASA Technical Reports Server, and NASA Technology Transfer</i> fact sheets discuss potential datasets which could be posted onto the Data.gov.
“Details as to how your agency is complying with transparency initiative guidance such as Data.gov, eRulemaking, IT Dashboard, Recovery.gov, and USAspending.gov. Where gaps exist, the agency should detail the steps the agency is taking and the timing to meet the requirements for each initiative.”	The <i>Financial Data Transparency</i> section discusses NASA’s compliance with Recovery.gov and USAspending.gov.
	The <i>Data.gov</i> section discusses compliance with data.gov requirements.
“Details of proposed actions to be taken, with clear milestones, to inform the public of significant actions and business of your agency, such as through agency public meetings, briefings, press conferences on the Internet, and periodic national town hall meetings.”	The <i>Public Affairs Web Initiatives</i> and <i>NASA Television</i> discusses how integral www.nasa.gov is in communicating news, upcoming events, and being able to watch it live.
A link to a Web site that includes (1) a description of your staffing, organizational structure, and process for analyzing and responding to FOIA requests; (2) an assessment of your agency’s capacity to	The link to NASA’s Freedom of Information Act page in the <i>FOIA</i> section of this report fulfils all of these requirements.

analyze, coordinate, and respond to such requests in a timely manner together with proposed changes, technological resources, or reforms that your agency determines are needed to strengthen your response processes; and (3) if your agency has a significant backlog, milestones that detail how your agency will reduce its pending backlog of outstanding FOIA requests by at least ten percent each year.	
A description or link to a Web page that describes your staffing, organizational structure, and process for analyzing and responding to Congressional requests for information.	The link to NASA's Office of Legislative and Intergovernmental Affairs in the <i>Congressional Correspondence</i> section of the report fulfils this requirement.
A link to a publicly available Web page where the public can learn about your agency's declassification programs, learn how to access declassified materials, and provide input about what types of information should be prioritized for declassification, as appropriate.	At the present, the Office of Protective Services Web site is undergoing renovation. The Web version of this report will temporarily serve to fulfill this requirement until OPS's new Web site launches within the next three months.

Section #2: Participation

Objective	Relevant Sections in Plan
"Your agency's Open Government Plan should explain in detail how your agency will improve participation, including steps your agency will take to revise its current practices to increase opportunities for public participation in and feedback on the agency's core mission activities. The specific details should include proposed changes to internal management and administrative policies to improve participation."	Principle #2 in the <i>Frameworks</i> section details NASA's intent to improve participation with the public. The Open Government Goals in the fact sheets with a Participation check-mark articulate how we will become more participatory. In particular, please see <i>Public Affairs – web initiatives</i> , <i>NASA Television</i> , <i>NASA Education Activities</i> , <i>Centennial Challenges</i> , and <i>Open Innovation Projects</i> . Also, see <i>Open Source at NASA</i> and the <i>Participatory Exploration Office</i> flagship projects.

<p>“The Plan should include descriptions of and links to appropriate Web sites where the public can engage in existing participatory processes of your agency.”</p>	<p>The <i>Public Affairs Web Initiatives</i> section discusses both NASA Chats and NASA’s Connect Web page, two online resources available to the public that open up various participatory processes through social media, communication with NASA experts, and opportunities to collaborate on NASA projects. Additionally, please look at the <i>Education Activities</i> fact sheet. As we implement the <i>Participatory Exploration Office</i> flagship project, there soon will be a clearinghouse for participatory projects for the public to contribute.</p>
<p>“The Plan should include proposals for new feedback mechanisms, including innovative tools and practices that create new and easier methods for public engagement.”</p>	<p>The <i>Citizenship Engagement Analysis</i> section discusses using the IdeaScale crowd sourcing tool in future NASA projects to solicit ideas and comments from the public.</p> <p>The <i>Open Source Software Development</i> section outlines the future of the open source movement at NASA, an innovative participatory process that allows for direct public participation in software development.</p>

Section #3: Collaboration

Objective	Relevant Sections in Plan
<p>“Your agency’s Open Government Plan should explain in detail how your agency will improve collaboration, including steps the agency will take to revise its current practices to further cooperation with other Federal and non-Federal governmental agencies, the public, and non-profit and private entities in fulfilling the agency’s core mission activities. The specific details should include proposed changes to internal management and administrative policies to improve collaboration. The Plan should include proposals to use technology platforms to improve collaboration among people within and outside your agency.”</p>	<p>Principle #3 in the <i>Frameworks</i> section details NASA’s intent to improve collaboration. The Open Government Goals in the fact sheets with a Collaboration check-mark articulate how we will become more collaborative. We have a very flexible founding legislation that allows us to enter into Space Act Agreement with external partners (see the <i>Space Act Agreement, Technology Transfer, and Open Innovation Pilots</i> section). We rely heavily on partnerships to conduct our mission and expand our utility (see <i>Mission Directorate</i> sections). For internal collaboration, see the <i>OCIO and Open Government, Citizen Engagement Analysis</i></p>

	appendix, and the <i>NASA Nebula</i> Flagship initiative.
“The Plan should include descriptions of and links to appropriate Web sites where the public can learn about existing collaboration efforts of your agency.	The <i>Open Innovation</i> , <i>Public Affairs Web Initiatives</i> , and <i>Centennial Challenges</i> sections contain links to multiple Web sites that feature opportunities to collaborate with NASA on various projects.
“The Plan should include innovative methods, such as prizes and competitions, to obtain ideas from and to increase collaboration with those in the private sector, non-profit, and academic communities.”	The <i>Centennial Challenges</i> section discusses NASA’s innovative method of using competitions to spur technology development and collaboration.

Section #4: Flagship Initiative

Objective	Relevant Sections in Plan
“Each agency’s Open Government Plan should describe at least one specific, new transparency, participation, or collaboration initiative that your agency is currently implementing (or that will be implemented before the next update of the Open Government Plan).”	NASA’s Open Government Plan specifies three new flagship initiative projects: <i>NASA Open Source Software Development</i> , <i>NASA Nebula Cloud Computing Platform</i> , and the <i>Participatory Exploration Office</i> . Each Flagship project is described in their respective sections.
An overview of the initiative, how it addresses one or more of the three openness principles, and how it aims to improve agency operations;	Each flagship initiative describes their Open Government principles and how they aim to improve NASA operations. To be explicit: Open Source – Transparency and Participation. This can speed up the development and lower cost of NASA software. This can also stimulate industry, as they are able to use NASA-released software.

	<p>NASA Nebula – Participation and Collaboration. Nebula, a robust open source cloud computing platform. will enhance collaboration as it makes is much cheaper and quicker for NASA programs to have computation resources, and increases inter-government collaboration through the use of similar computation platforms.</p> <p>Participatory Exploration – Participation. This is bringing the citizen into NASA’s mission in a meaningful way during mission formulation. NASA can partner with the public to conduct aeronautics research and explore space.</p>
An explanation of how your agency engages or plans to engage the public and maintain dialogue with interested parties who could contribute innovative ideas to the initiative;	<p>The website: opennasa.ideascale.com is another engagement tool which has a forum for each fact sheet. The <i>Citizenship Engagement Analysis</i> and <i>Data.gov at NASA</i> section discusses using the IdeaScale crowd sourcing tool in future NASA projects to solicit ideas and comments from the public. Specifically for the Flagship projects: <i>Open Source</i> is planning on using Github to store code which has many social coding features; <i>NASA Nebula</i> will be at relevant conferences and plans release its first open source within six months; and <i>Participatory Exploration</i> plans to Use direct (workshops) and indirect (Web polls) methods to generate and gauge external interest in and information on participation.</p>
If appropriate, identification of any partners external to your agency with whom you directly collaborate on the initiative;	<p>The <i>Open Source</i> section discusses integration with SourceForge.com and Github to host NASA software. <i>NASA Nebula</i> has already partnered with GSA for usaspending.gov 2.0 and is open for additional partnerships. <i>Participatory Exploration</i> intends to partner with the public, but also support the participatory partnerships between NASA and the large IT companies (Google, Microsoft, etc.).</p>

<p>An account of how your agency plans to measure improved transparency, participation, and/or collaboration through this initiative;</p>	<p>The <i>Open Source</i> initiative discusses metrics for determining the success of the project. Metrics will be a large part of the research the <i>Participatory Exploration Office</i> will conduct to provide programmatic utility for public participation in NASA's missions. These metrics will be shared with other government agencies, if applicable.</p>
<p>An explanation of the steps your agency is taking to make the initiative sustainable and allow for continued improvement.</p>	<p>The <i>Framework</i> section describes our approach toward Open Government being an interactive, continuous learning approach. This is also true for the Flagship projects. The 3 month, 6 month, 1 year and 2 year goals we articulate is our best forecast toward bringing these three transformative projects into NASA. When successes are celebrated we intend to solidify the approach into policy to make it part of the institutional memory for NASA. Good policies become part of our culture and therefore are sustainable.</p>